Macrozoobenthos Collections from Lakes and Streams of the Experimental Ponds Area, Central Newfoundland, 1977-82

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Numbers 1-25 in this series were issued as Fisheries and Marine Service Data Records. Numbers 26-160 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Data Reports. The current series name was changed with report number 161.

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Les numéros 1 à 25 de cette série ont été publiés à titre de Records statistiques, Service des pêches et de la mer. Les numéros 26-160 ont été publiés à titre de Rapports statistiques du Service des pêches et de la mer, Ministère des Pêches et de l'Environnement. Le nom de la série a été modifié à partir du numéro 161.

Le titre exact paraît au haut du résumé de chaque rapport.

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MACROZOOBENTHOS COLLECTIONS FROM LAKES AND STREAMS OF THE EXPERIMENTAL PONDS AREA, CENTRAL NEWFOUNDLAND, 1977-82

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ABSTRACT

Ryan, P. M., L. J. Cole, and D. P. Riche. 1985. Macrozoobenthos collections from lakes and streams of the Experimental Ponds Area, central Newfoundland, 1977-82. Can. Data Rep. Fish. Aquat. Sci. 514: v + 100 p.

Macrozoobenthos collections were obtained from two lakes and five streams in the Experimental Ponds Area, central Newfoundland, for the purpose of documenting natural variation in the biota of a comparatively undisturbed freshwater ecosystem. Collections were first obtained in 1977 from one lake and two of its three tributaries and increasingly larger amounts of data were collected, with the inclusion of a second lake and its tributaries in 1979, until 1982. Bi-monthly collections from May to October were obtained from the lakes with Ekman grab samplers (4- and 6-year time series) and from the streams with surber samplers (4- to 6-year series), 15 minute drift net samplers (4- to 6-year series), and 24 hour drift net samplers (3-year series). More intensive sampling was done on an annual basis with Ekman grab samplers on the lakes (4- and 5-year series) and with artificial substrate samplers on the lakes (2-year series) and streams (3-year series). A total of 147,706 animals were identified to various taxonomic levels, with further separation by life stage, in 4,944 samples. The resulting information was stored in computer files. The 303 taxa identified consisted of: 18 classes, subclasses, or phyla; 32 orders or suborders; 112 families; 93 genera; and 48 species. The most abundant taxa and the average catch of each (no. sample^{-1}) were: the amphipod, Hyallella azteca (4.6); larval blackflies, Simuliidae (4.1); clams, Sphaeriidae (3.6); larval midges, Chironomidae (3.5); and nymphal mayflies, Paraleptophlebia (1.9). The dry weights of animals collected with Ekman grab and artificial substrate samplers from 1980 to 1982 were obtained for biomass comparisons and included in the body of the report. The majority of animals collected have been retained and stored. Macrozoobenthos collections from the Experimental Ponds Area may serve as indicators of long-term environmental change in the study area and as comparative data for waters subjected to experimental manipulation or other forms of environmental change elsewhere.

RÉSUMÉ

Ryan, P. M., L. J. Cole, and D. P. Riche. 1985. Macrozoobenthos collections from lakes and streams of the Experimental Ponds Area, central Newfoundland, 1977-82. Can. Data Rep. Fish. Aquat. Sci. 514: v + 100 p.

On a prélevé des spécimens du macrozoobenthos dans deux lacs et cinq cours d'eau de la Région des étangs expérimentaux, dans le centre de Terre-Neuve, afin d'observer la variation naturelle touchant le biote dans un écosystème d'eau douce relativement peu perturbé. L'expérience a commencé en 1977 avec un lac et deux de ses trois affluents, mais la quantité de données prélevées a augmenté constamment jusqu'en 1982, avec l'addition en 1979 d'un autre lac et de ses affluents. Les prélèvements bimensuels effectués entre mai et octobre étaient réalisés à l'aide de la benne d'Ekman dans le cas des lacs (séries de

données portant sur 4 et 6 ans) et à l'aide d'échantillonneurs Surber (séries de 4 à 6 ans), d'échantillonneurs à filet dérivant pendant 15 minutes (séries de 4 à 6 ans) et d'échantillonneur à filet dérivant pendant 24 heures (séries de 3 ans) dans le cas des cours d'eau. Un échantillonnage plus poussé était réalisé sur une base annuelle avec la benne d'Ekman dans le cas des lacs (séries de 4 et 5 ans) et avec des échantillonneurs à substrat artificiel dans le cas des lacs (séries de 2 ans) et des cours d'eau (séries de 3 ans). Au total, 147 706 animaux ont été identifiés jusqu'à différents niveaux toxonomiques, avec répartition selon le stade de la vie, à partir de 4944 échantillons. Les données obtenues ont été emmagasinées dans des fichiers informatisés. Les 303 taxons identifiés comprenaient : 18 classes, sous-classes ou phylums, 32 ordres ou sous-ordres, 112 familles, 93 genres et 48 espèces. Les taxons les plus abondants et la prise moyenne pour chacun sont: amphipode Hyallella azteca (4,6); larves de mouche noire, Simuliidae (4,1); bivalves Sphaeriidae (3,6); moustiques larvaires Chironomidés (3,5) et nymphes d'éphémères, Paralephtophlebia (1,9). Le poids en matière sèche des animaux prélevés de 1980 à 1982 avec la benne d'Ekman et les échantillonneurs à substrat artificiel a été déterminé pour établir des comparaisons de biomasse. Il a été inclu dans le rapport. La majorité des animaux prélevés ont été conservés et entreposés. Les échantillons de macrozoobenthos de la Région des étangs expérimentaux peuvent servir d'indicateurs des changements environnementaux survenant à long terme dans la zone d'étude; ils peuvent aussi servir de données de comparaison pour des eaux subissant des traitements expérimentaux ou d'autres formes de changements environnementaux.

INTRODUCTION

This report is a description of the materials and methods used and a summary of the data obtained in the sampling of the macrozoobenthos of the Experimental Ponds Area from 1977 to 1982. The term macrozoobenthos, as used for practical purposes in this report, refers to the larger, bottom-dwelling, lake and stream animals which are retained by sieves of 1050 micron mesh and/or are visible without the aid of magnifying devices. These animals are an important food of fishes. Increasingly larger amounts of macrozoobenthos and other limnological data were obtained from the Experimental Ponds Area from 1977 to 1982 for the purpose of documenting natural variation in the biota and habitat of a comparatively undisturbed freshwater ecosystem. The Experimental Ponds Area consists of small lakes and their tributary streams at the headwaters of the Northwest Gander River, Newfoundland (Fig. 1). The physical and chemical limnology of the Area has been summarized by Ryan and Wakeham (1984). Aspects of the biology of the Area have been detailed in reports on zooplankton (Ryan 1982, 1984a), fish parasites (Cone and Ryan 1984), salmonid age and growth (Ryan et al. 1981), salmonid catchability (Ryan 1984b), and stickleback growth and food (Ryan 1984c).

This report describes the macrozoobenthos data base from two lakes, Headwater Pond (48° 16' 51"N, 55° 29' 39"W) and Spruce Pond (48° 19' 40"N, 55° 28' 24"W), and five streams adjacent to these lakes. The streams are the inlet and outlet of Headwater Pond and Spruce Pond's major inlet, minor inlet, and outlet. Although some analyses are included, this report is intended primarily as a medium for documenting and filing information and statistics for examination, comparisons with other studies, and more detailed analyses in future reports. This report will serve as a foundation for the analysis and interpretation of the macrozoobenthos data stored in computer files.

MATERIALS AND METHODS

SAMPLE COLLECTION

Macrozoobenthos samples from the lakes were collected with Ekman grab samplers and artificial substrates. Stream sampling was done with Surber samplers, drift nets, and artificial substrates. These devices and their use are reviewed in Welch (1948), Edmondson and Winberg (1971), and Stirn (1981).

An Ekman grab sample was collected from each of four lake stations at approximate bi-monthly intervals (bi-monthly Ekman grab samples) from May to October, starting in 1977 in Spruce Pond (Fig. 2 and 3) and 1979 in Headwater Pond (Fig 4). Occasionally, a sample was obtained from one or more of these lake stations through the ice in winter. Five Ekman grab samples were collected from each of forty lake stations of various depths (contour Ekman grab samples) in the latter half of July starting in 1978 in Spruce Pond (Fig. 5) and 1979 in Headwater Pond (Fig. 6 and 7). Ekman grab samplers used were standard Wildco Ekman grabs which sampled a bottom area of 231 cm^2 and had chamber volumes of 3940 cm^3. The contents of the grab samplers were individually transferred to one gallon plastic buckets for later processing.

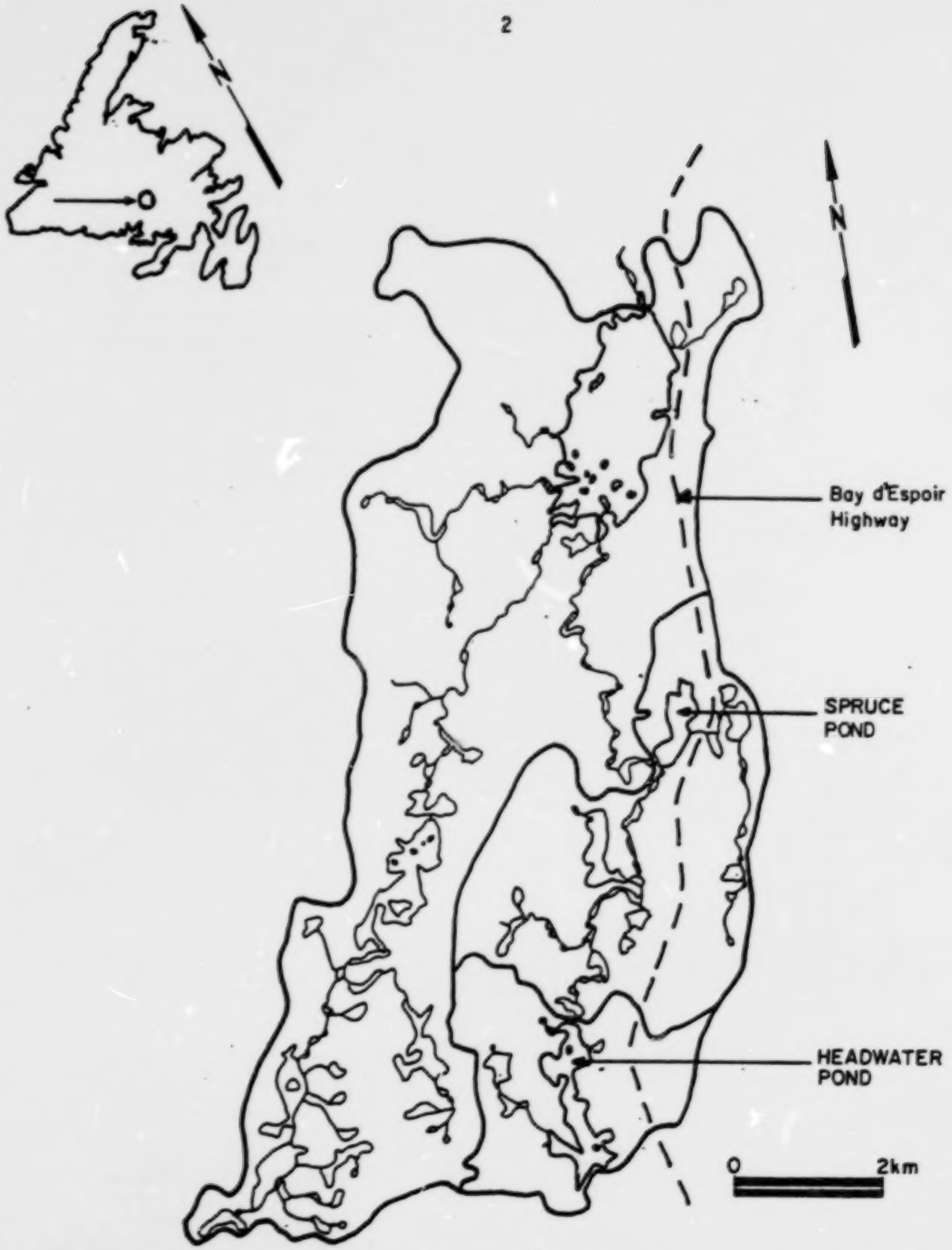

Fig. 1. Locations and catchment basins of the study lakes in the Experimental Ponds Area, central Newfoundland.

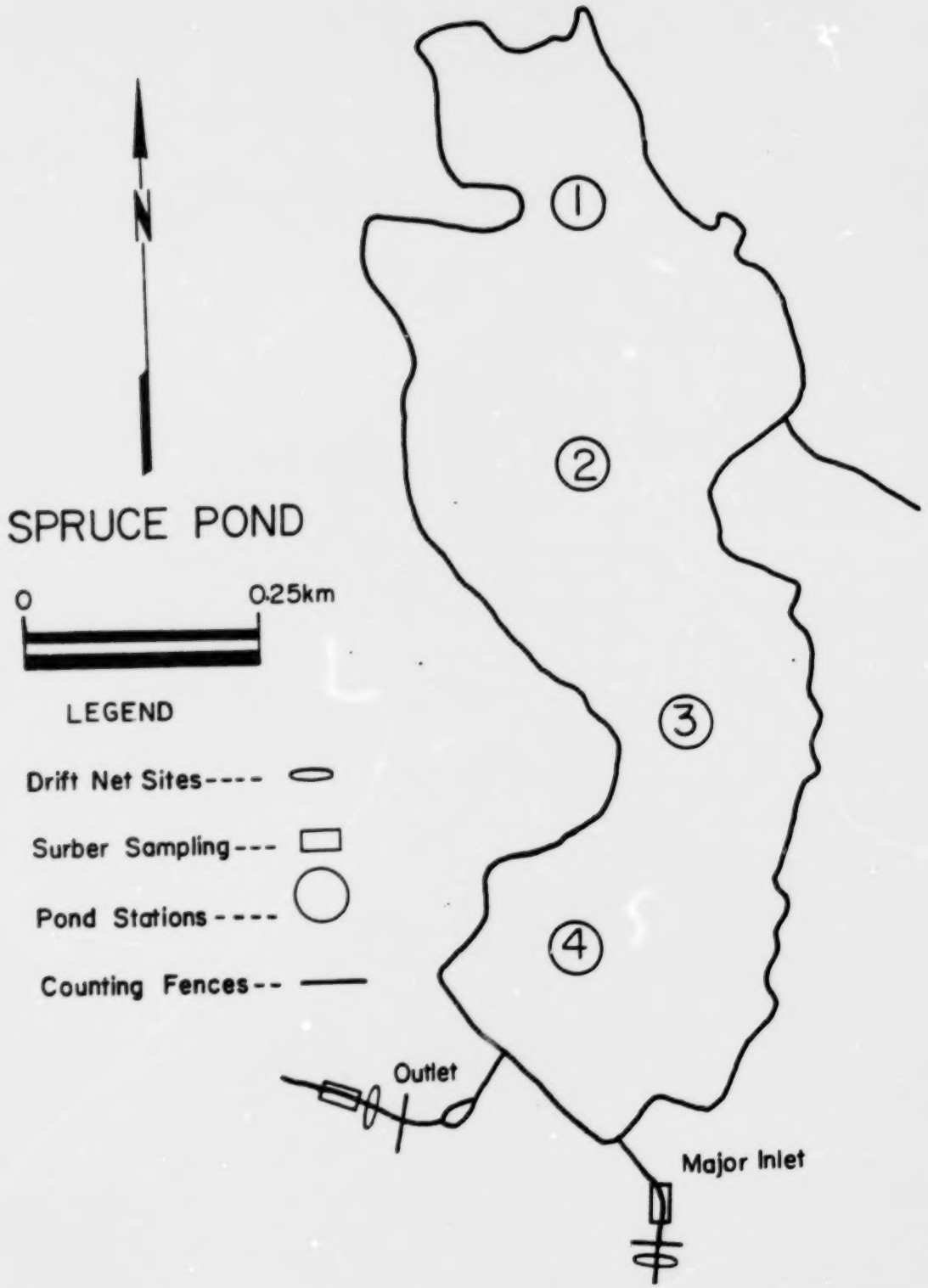

Fig. 2. Locations of bi-monthly Ekman grab samples, Surber samples, and drift net samples in Spruce Pond and its tributaries in 1977. Locations of stream counting fences for fishes are included for reference.

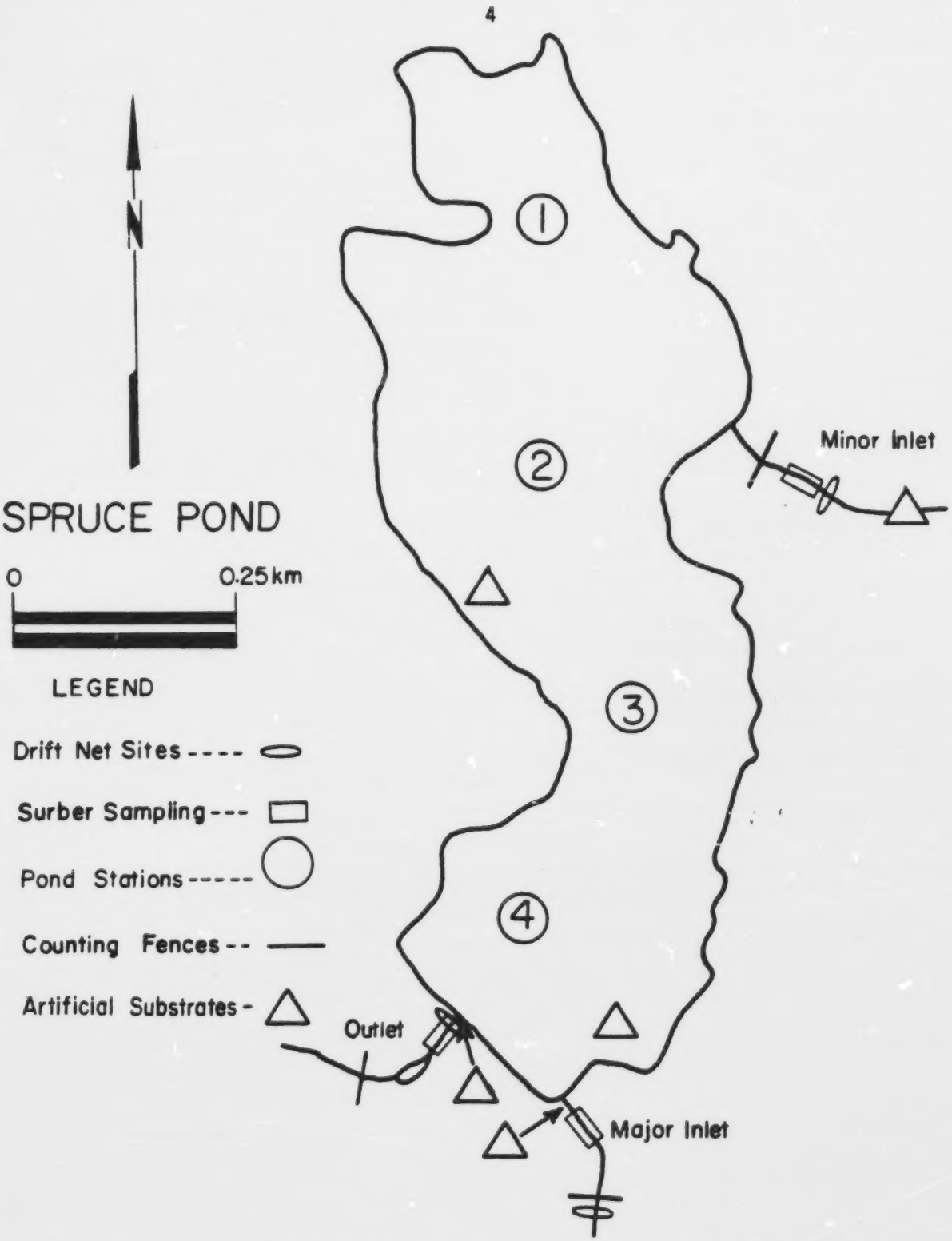

Fig. 3. Locations of bi-monthly Ekman grab samples, artificial substrate samples, Surber samples, and drift net samples in Spruce Pond and its tributaries from 1978 to 1982. Locations of stream counting fences for fishes are included for reference.

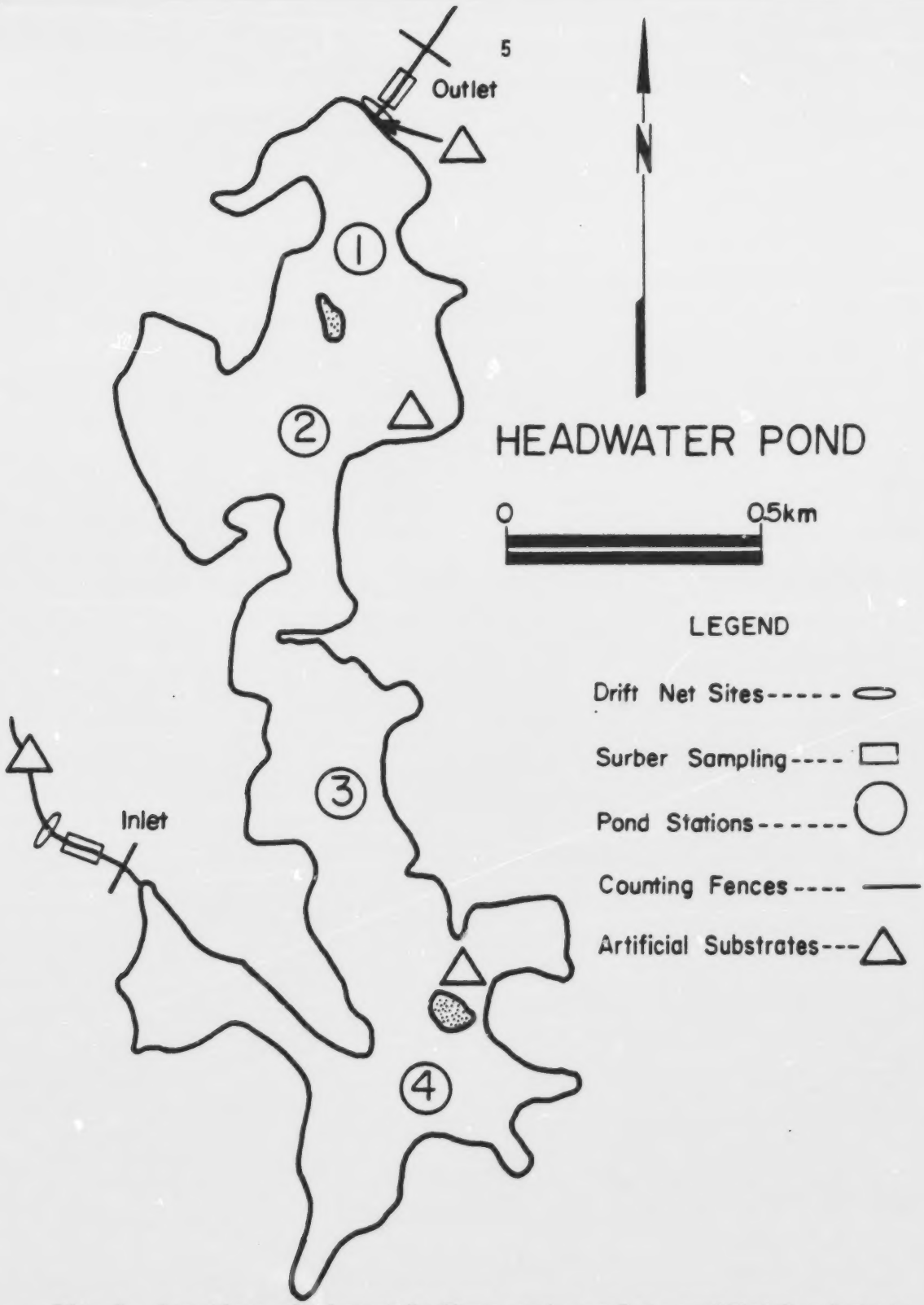

Fig. 4. Locations of bi-monthly Ekman grab samples, artificial substrate samples, Surber samples, and drift net samples in Headwater Pond and its tributaries from 1979 to 1982. Locations of stream counting fences for fishes are included for reference.

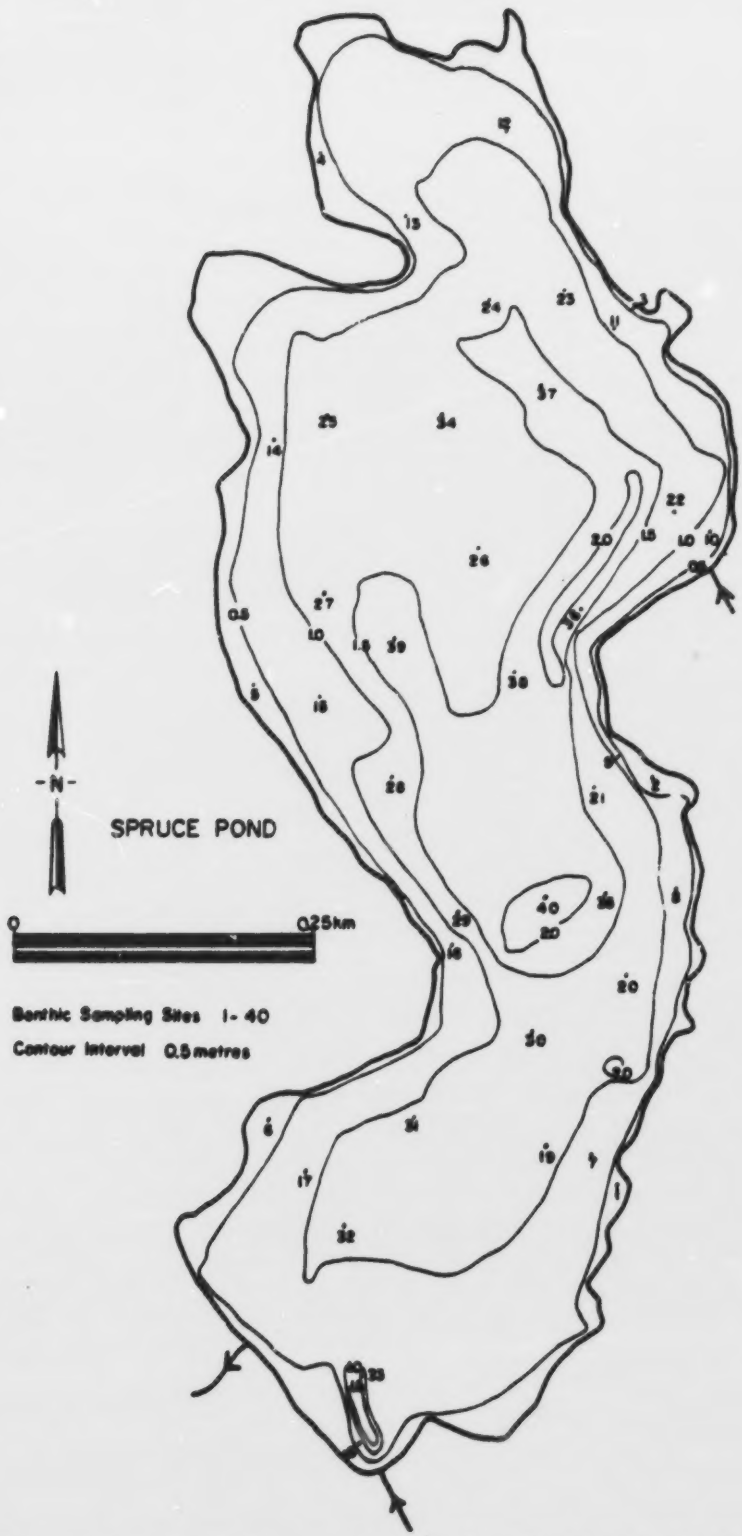

Fig. 5. Locations of contour Ekman grab samples in Spruce Pond, 1978-82.

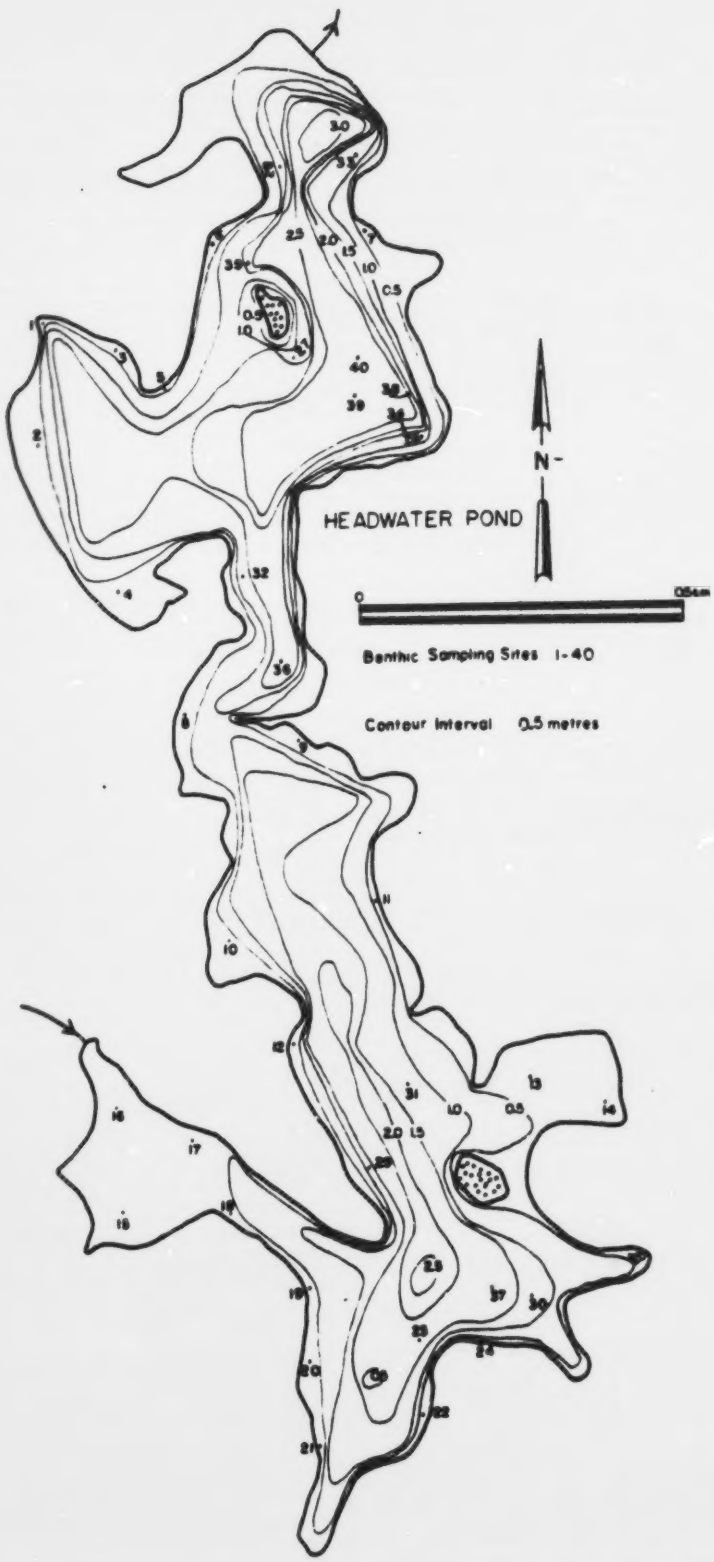

Fig. 6. Locations of contour Ekman grab samples in Headwater Pond, 1979.

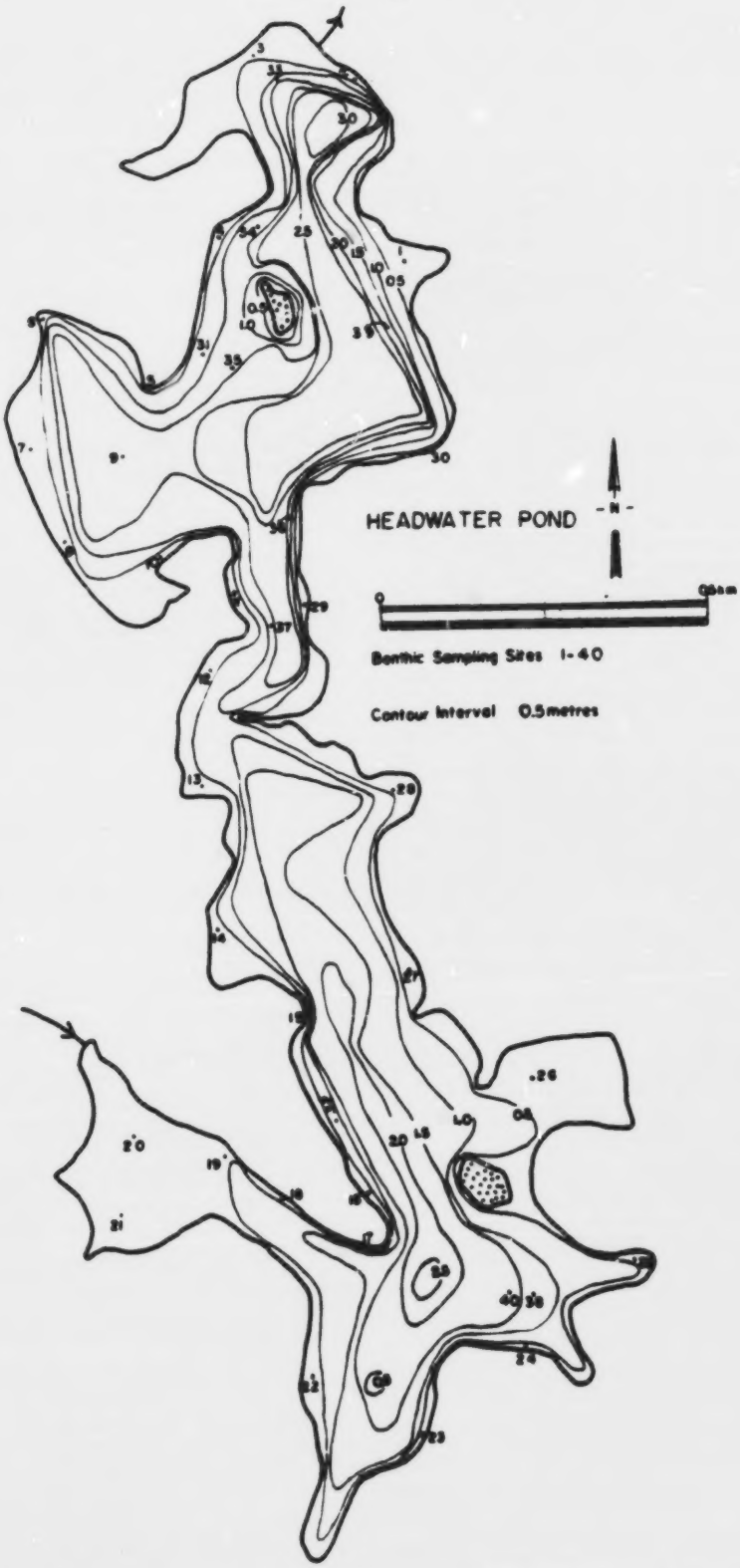

Fig. 7. Locations of contour Ekman grab samples in Headwater Pond, 1980-82.

Ten artificial substrates were placed at each of two locations in Spruce (Fig. 3) and Headwater (Fig. 4) ponds in the first half of May and removed in the latter half of September in 1981 and in 1982. Artificial substrates were 11.7 liter brown plastic dishpans (33.7 cm x 28.6 cm x 13.3 cm) drilled throughout with a 9.5 mm diameter drill bit and filled with approximately fist-size (5-13 cm) rocks. Each dishpan was lifted from the lake bottom with a rope harness attached to the four corners and placed in an undrilled pan. Rocks were removed and cleaned of macroinvertebrates. These and all materials remaining in each of the pans were transferred to individual 1 gallon plastic buckets for later processing. Rocks were returned to the drilled dishpan and, next spring, to the same lake location.

Nine Surber samples were collected across the width of the streams from stream sampling locations at approximate bi-monthly intervals from May to October, starting in 1977 in Spruce Pond's major inlet and outlet (Fig. 2), in July of 1978 in Spruce Pond's minor inlet (Fig. 3), and in 1979 in Headwater Pond's inlet and outlet (Fig. 4). An attempt was made to avoid sampling exactly at the same spot twice in a year, thereby avoiding population depletion, by sampling different areas within the sampling locations on subsequent sample dates. This was done by sampling 1-2 meters upstream or downstream of preceding sample areas for the year. Sampling locations were the same in each stream each year except for those in Spruce Pond's major inlet and outlet in 1977 which were, respectively, about 30 m upstream and about 80 m downstream of sampling locations used in subsequent years. The 1977 sampling locations were changed in 1978 as it was thought, at the time, that this was necessary to avoid population depletion. Stream velocities and substrate characteristics were similar in both major inlet sampling locations. However, the outlet sampling location used in 1977 had a similar substrate but greater stream velocity than that used in subsequent years. Surber samplers had sampling and net inlet areas of 305 mm x 305 mm and a net mesh size of 1050 microns. Each Surber sample was individually transferred to a one gallon plastic bucket for later processing.

Fifteen minute drift net samples were collected from stream sampling locations (Fig. 2, 3, and 4) concurrent with Surber sampling. Drift net samples were obtained from the same location on each stream on each sampling date except in 1977 when drift nets were set downstream of the fish counting fence on Spruce Pond's outlet (Fig. 2). In subsequent years, drift nets were set upstream of the counting fence to allow unobstructed flows (Fig. 3). Three nets were set in each stream on each sampling date except for the two smallest streams, Spruce Pond's minor inlet and Headwater Pond's inlet, where one net was used. Drift nets were standard Wildco drift-net assemblies with a length of 991 mm, a mesh size of 363 microns, and a sampling inlet area of 300 mm x 450 mm. Nets were left open for 15 minutes on each sampling date, collapsed, and the total catch from each stream was placed into a one gallon plastic bucket for later processing.

Twenty-four hour drift net sampling was started in 1980, at the same locations as, and just after 15 min drift net and Surber sampling. One net, identical to those used for 15 min samples, was set in each stream location (Fig. 3 and 4) around midday, collapsed after 24 hours, and the total catch

from each stream was placed into a one gallon plastic bucket for later analyses.

Fifteen artificial substrates were placed in stream sampling locations in June, 1979 (Fig. 3 and 4). Surviving substrates were removed in the first two weeks of each September from 1980 to 1982 and cleaned, as were the lake artificial substrates. Stream artificial substrates were returned to the streams after sampling, with replacement of spilled[1] and recovered substrates, until the next sampling period. Artificial substrates in the streams were the same as those in the lakes except that a rope harness was not attached.

SAMPLE WASHING AND PRESERVATION

The great majority of the benthic samples were individually washed on a 1050 micron mesh sieve using a low pressure garden hose to remove the bulk of sediment and detritus. Occasionally, samples did not require washing. The sieved or entire sample was transferred to a plastic pan containing approximately one liter of water. Animals were removed using forceps and eyedroppers, transferred to labelled vials, bottles, and plastic bags, and preserved in 10% formalin in 1977 or, in subsequent years, in 70% ethanol. Typically, samples were processed at the field laboratory within a day or two of collection so that the animals were alive and moving and thus more readily sighted and recovered.

IDENTIFICATION AND COUNTING

Identification and counting of animals captured from 1977 to 1979 were done in the St. John's laboratory of the Department of Fisheries and Oceans. Subsequently, this work was done via contracts to various organizations and individuals outside the department. Ekman grab samples were processed by Hurley Fisheries Consulting. Artificial substrates were done by Beak Consultants Limited (1980-81 samples) and by Dr. M.H. Colbo of Memorial University. Drift net samples were processed by Dr. D.L. Larson of Memorial University (1980-81 samples) and M. Larson (1982 samples).

Useful texts for identification purposes included Edmondson (1959), Borror and White (1970), Edmunds et al. (1976), Wiggins (1977), Merritt and Cummins (1978), Pennak (1978), and Clarke (1981). Systematic positioning and taxonomic nomenclature of all taxa identified are detailed in Ryan (1983). Most taxa, particularly the insects, were further separated by life stage.

All individuals in each taxa identified were counted except in rare instances (i.e. Chironomidae larvae in some 24 hour drift net samples) when the numbers of abundant individuals were obtained from randomly selected aliquots.

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[1]Occasionally, artificial substrates had been spilled during ice breakup in winter and spring or by people examining the contents.

BIOMASS DETERMINATIONS

Dry weights of animals collected with Ekman grab samplers and artificial substrates from 1980 to 1982 were determined for the purposes of direct comparisons of these data and the calculation of biomass in other individual samples. In order to obtain large quantities, like taxa, separated by life stage where appropriate, were combined and weighed within each of the following categories: bimonthly Ekman grab samples from each lake each year; contour Ekman grab samples from each lake each year; artificial substrates from each lake each year; and artificial substrates from each stream each year.

The pooled, ethanol-preserved samples were rinsed three times with fresh ethanol to remove fats in solution, placed in pre-weighed aluminum pans, and stored in a fume hood to evaporate the ethanol for approximately 24 hours. Samples were then oven-dried for 24 hours at 37°C. Weights were obtained with a Sartorius electronic balance to the nearest 0.0001 g. Sample weights were obtained by subtraction.

All molluscs were weighed with their shells. Weight determinations excluded free eggs and, with one exception, exuvia (cases, empty shells, remains). The cases of the caddisfly family Hydroptilidae were weighed if the tiny, difficult-to-remove, larvae were inside.

DATA STORAGE AND SAMPLE RETENTION

Taxa identified, the life stage of each where known, and the number of individuals of each in each sample, together with sample type, date, and location, were stored in computer files using the life form code of Ryan (1983) and codes for data retrieval on file at the Northwest Atlantic Fisheries Centre. Results of the dry weight determinations are included as appendices to this report.

In each of the sample categories (i.e. bi-monthly Ekman grab samples, Surber samples, 15 min drift samples, etc.), the number of samples from a given time or location which were processed to completion (stored in computer files) may be less than that planned for in the experimental design. This was due to a number of factors such as samples not being taken due to low or high water levels (i.e. Surbers, drifts), samples lost due to breakage in transport, and samples destroyed in streams by people or by ice (i.e. stream artificial substrates). The number of samples completely processed from a given time or location is available on the computer files.

The majority of animals captured were retained and stored, in ethanol preservative, for any future examinations considered desirable.

RESULTS AND DISCUSSION

A total of 4,944 macrozoobenthos samples were collected and processed, with the majority being Surber samples and contour Ekman grab samples (Table 1).

Table 1. Number of macrozoobenthos samples processed, with separation by sample type, location, and year.

Location	Sample type	Year					
		1977	1978	1979	1980	1981	1982
Headwater Pond and tributaries	Bimonthly Ekman grabs			41	40	41	41
	Contour Ekman grabs			200	191	200	200
	Lake artificial substrates					20	20
	Inlet surbers			90	90	90	90
	Outlet surbers			90	90	90	90
	Inlet 15 min drifts			10	10	10	10
	Outlet 15 min drifts			10	10	10	10
	Inlet 24 h drifts				8	10	10
	Outlet 24 h drifts				8	10	10
	Inlet artificial substrates				14	13	13
	Outlet artificial substrates				11	11	12
	All types			441	472	505	506
Spruce Pond and tributaries	Bimonthly Ekman grabs	32	44	42	40	41	41
	Contour Ekman grabs		195	200	200	196	200
	Lake artificial substrates					20	20
	Major inlet surbers	54	99	90	80	81	90
	Minor inlet surbers		72	90	81	90	90
	Outlet surbers	54	99	90	80	90	90
	Major inlet 15 min drifts	5	9	10	6	8	10
	Minor inlet 15 min drifts		7	10	7	9	10
	Outlet 15 min drifts	6	9	10	8	10	10
	Major inlet 24 h drifts				4	8	10
	Minor inlet 24 h drifts				4	10	9
	Outlet 24 h drifts				4	10	10
	Major inlet artificial substrates				14	13	13
	Minor inlet artificial substrates				11	12	12
	Outlet artificial substrates				13	14	14
	All types	151	534	542	552	612	629
All locations	All types	151	534	983	1,024	1,117	1,135

A total of 303 different taxa, with further separation by life stage, were identified in the samples (Appendix 1). These taxa consist of 18 classes, subclasses or phyla, 32 orders or suborders, 112 families, 93 genera, and 48 species.

Not all taxa identified in the samples can be considered as macrozoobenthos. The smallest organisms such as Protozoa, Hydrozoa, Copepoda, and Cyclopoida were most likely drawn up with water when larger animals were removed from sample containers with eyedroppers. Although these small animals were identified and counted in many samples by contractors, they should be considered as by-catches not captured in proportion to their numbers in the lakes and streams. The majority of these organisms taken during sampling would have been discarded during the washing process. Similarly, the fish (i.e. Gasterosteus aculeatus, Salmonidae) and terrestrial invertebrates (i.e. Formicidae, Cicadellidae) captured are not macrozoobenthos. However, records of these catches may serve for future comparisons.

The number of animals counted, exclusive of exuvia, was 147,706 with the average count being 29.9 animals sample^{-1} (Appendix 1). Counts of most taxa averaged less than one animal sample^{-1}. The most abundant taxa, and the corresponding catch of each, expressed as the mean number of animals sample^{-1}, were:

the amphipod, Hyallella azteca (4.6);
larval blackflies, Simuliidae (4.1);
clams, Sphaeriidae (3.6);
larval midges, Chironomidae (3.5); and
nymphal mayflies, Paraleptophlebia (1.9).

The relative abundance of each taxon in the catches can, of course, be expected to have varied with sample type, sample location, and sample date.

The dry weights of animals collected with Ekman grab and artificial substrate samples from 1980 to 1982 (Appendix 2-5) are available for the direct comparison of these data and the calculation of biomass in other individual samples. The application of a calculated average weight to individual samples is subject to the error associated with seasonal and annual changes in the weight of an individual animal. Comparisons of calculated average weights in the samples obtained throughout the May to October period (bi-monthly Ekman grab samples) to those calculated weights obtained from samples taken at discrete times (contour Ekman grab samples) will provide an indication of the magnitude of these changes and their importance for practical application.

Macrozoobenthos data obtained during the study, when analysed with corresponding physical-chemical data such as stream flows and water chemistry and temperature (Ryan and Wakeham 1984), can be expected to contribute to the understanding of factors affecting the abundance and distribution of life forms in comparatively undisturbed freshwater systems. Such analyses have been done with data from the zooplanton communities of the study area (Ryan 1984a). In addition, the macrozoobenthos data obtained, when compared to data obtained in the future, may serve as indicators of long-term environmental change in the study area. Similarly, these data may serve as comparative data for waters

subjected to experimental manipulation or other forms of environmental change. Examples of the use of macrozoobenthos data for these purposes can be found in Hellawell (1978), NRCC (1981), and Stirn (1981).

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G. Furey, R. Green, J. Hinks, B. Meaney, R. Peddle, D. Wakeham, and A. Young assisted with sample collection.

M.H. Colbo, D.J. Larson, M. Larson, staff of Beak Consultants Limited, and the staff of Hurley Fisheries Consulting identified and counted the animals captured from 1980 to 1982. D.J. Larson and M.F. O'Connell frequently assisted with the identification of animals captured prior to 1980.

A. Dunphy and S. Freimanis coded much of the raw data and proofread coding done by others prior to computer entry.

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G. Marshall and G. Somerton did the computer programming to generate summary tables of macrozoobenthos catches.

A. C. Dey and J. W. Kiceniuk provided an analysis of lipid concentrations in the ethanol used for preservative so that an appropriate rinsing technique could be applied.

D. Wakeham prepared the figures.

M. Bursey and K. Harding typed the report.

R. J. Gibson and M. F. O'Connell constructively reviewed the manuscript.

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APPENDIX 1: MACROZOOBENTHOS CAPTURED IN THE EXPERIMENTAL PONDS AREA, 1977-82.

Table 1. Macrozoobenthos captured in the Experimental Ponds Area, 1977-82. Number of samples was: 4944.

TAXA	LIFE STAGE	----CODE----- TAXA	LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
PROTOZOA		0100000000	.	1849	0.3740	0	200	5.2665
PROTOZOA	ADULT	0100000000	1	20	0.0040	0	20	0.2844
PROTOZOA	EXUVIA	0100000000	7	24	0.0049	0	7	0.1255
PROTOZOA CILIOPHORA		0102000000	.	3076	0.6222	0	300	8.0177
PROTOZOA CILIOPHORA	EXUVIA	0102000000	7	4	0.0008	0	2	0.0348
PROTOZOA TESTICIDA	EXUVIA	0105000000	7	2	0.0004	0	1	0.0201
HYDROZOA		0500000000	.	55	0.0111	0	9	0.2083
HYDROIDA HYDRIDAE		0501010000	.	2	0.0004	0	1	0.0201
HYDRIDAE HYDRA		0501010100	.	13	0.0026	0	4	0.0711
TURBELLARIA		0700000000	.	180	0.0364	0	13	0.4564
TRICLADIDA PLANARIIDAE		0705010000	.	562	0.1137	0	35	1.0539
TRICLADIDA PLANARIIDAE	ADULT	0705010000	1	3	0.0006	0	2	0.0318
ROTATORIA PLOIMA		1706000000	.	2	0.0004	0	2	0.0284
NEMATODA		1900000000	.	118	0.0239	0	17	0.3429
NEMATOMORPHA		2000000000	.	2	0.0004	0	2	0.0284
NEMATOMORPHA GORDIOIDEA		2001000000	.	19	0.0038	0	3	0.0841
ACANTHOCEPHALA		2200000000	.	1	0.0002	0	1	0.0142
TARDIGRADA		2300000000	.	1	0.0002	0	1	0.0142
BRYOZOA		2600000000	.	26	0.0053	0	3	0.0852
BRYOZOA	PUPA	2600000000	5	15	0.0030	0	3	0.0651
BRYOZOA	EXUVIA	2600000000	7	1488	0.3010	0	103	2.3734
GASTROPODA		3000000000	.	123	0.0249	0	12	0.3037
GASTROPODA	ADULT	3000000000	1	41	0.0083	0	19	0.2833
GASTROPODA	JUVENILE	3000000000	2	5	0.0010	0	1	0.0318
GASTROPODA	EXUVIA	3000000000	7	13	0.0026	0	1	0.0512
MESOGASTROPODA HYDROBIIDAE		3001040000	.	757	0.1531	0	8	0.6003
MESOGASTROPODA HYDROBIIDAE	JUVENILE	3001040000	2	1	0.0002	0	1	0.0142
MESOGASTROPODA HYDROBIIDAE	EXUVIA	3001040000	7	168	0.0340	0	6	0.2286
HYDROBIIDAE AMNICOLA		3001040100	.	142	0.0287	0	17	0.3816
MESOGASTROPODA VIVIPARIDAE		3001050000	.	290	0.0587	0	21	0.5328
VIVIPARIDAE VIVIPARUS		3001050100	.	228	0.0461	0	28	0.5602
MESOGASTROPODA VALVATIDAE		3001060000	.	393	0.0795	0	11	0.5325
MESOGASTROPODA VALVATIDAE	EXUVIA	3001060000	7	161	0.0326	0	13	0.3725
VALVATIDAE VALVATA		3001060100	.	90	0.0182	0	15	0.4004
ARCHAEOGASTROPODA NERTIDAE		3002010000	.	7	0.0014	0	5	0.0766
GASTROPODA BASOMMATOPHORA		3003000000	.	1	0.0002	0	1	0.0142
BASOMMATOPHORA PHYSIDAE		3003010000	.	36	0.0073	0	3	0.1003
BASOMMATOPHORA PHYSIDAE	JUVENILE	3003010000	2	1	0.0002	0	1	0.0142
BASOMMATOPHORA PHYSIDAE	EXUVIA	3003010000	7	11	0.0022	0	1	0.0471
PHYSIDAE PHYSA		3003010100	.	5	0.0010	0	1	0.0318
BASOMMATOPHORA LYMNAEIDAE		3003020000	.	58	0.0117	0	4	0.1359
LYMNAEIDAE STAGNICOLA		3003020200	.	12	0.0024	0	2	0.0568
BASOMMATOPHORA PLANORBIDAE		3003030000	.	275	0.0556	0	5	0.2969
BASOMMATOPHORA PLANORBIDAE	ADULT	3003030000	1	4	0.0008	0	2	0.0348
BASOMMATOPHORA PLANORBIDAE	JUVENILE	3003030000	2	43	0.0087	0	6	0.1427
BASOMMATOPHORA PLANORBIDAE	EXUVIA	3003030000	7	165	0.0334	0	3	0.2183
PLANORBIDAE HELISOMA		3003030100	.	162	0.0328	0	13	0.3170
PLANORBIDAE HELISOMA	EXUVIA	3003030100	7	1	0.0002	0	1	0.0142
PLANORBIDAE GYRAULUS		3003030200	.	39	0.0079	0	5	0.1355

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Table 1 (cont'd)

TAXA	LIFE STAGE	CODE TAXA	CODE LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
BASOMMATOPHORA ANCYLIDAE		3003060000	.	35	0.0071	0	15	0.2314
ANCYLIDAE FERRISSIA		3003060100	.	62	0.0125	0	16	0.2954
PELECYPODA		3300000000	.	5	0.0010	0	1	0.0318
PELECYPODA	ADULT	3300000000	1	37	0.0075	0	11	0.1985
PELECYPODA	JUVENILE	3300000000	2	1	0.0002	0	1	0.0142
PELECYPODA	EXUVIA	3300000000	7	5	0.0010	0	2	0.0376
EULAMELLIBRANCHIA UNIONIDAE		3301010000	.	65	0.0131	0	2	0.1191
EULAMELLIBRANCHIA UNIONIDAE	JUVENILE	3301010000	2	11	0.0022	0	2	0.0512
EULAMELLIBRANCHIA UNIONIDAE	EXUVIA	3301010000	7	29	0.0059	0	1	0.0764
HETERODONTA SPHAERIIDAE		3302010000	.	17709	3.5819	0	2140	39.0602
HETERODONTA SPHAERIIDAE	JUVENILE	3302010000	2	1	0.0002	0	1	0.0142
HETERODONTA SPHAERIIDAE	EXUVIA	3302010000	7	75	0.0152	0	4	0.1477
HIRUDINEA		3500000000	.	2599	0.5257	0	75	2.6851
HIRUDINEA	ADULT	3500000000	1	10	0.0020	0	3	0.0603
HIRUDINEA	JUVENILE	3500000000	2	8	0.0016	0	8	0.1138
HIRUDINEA	EGG	3500000000	6	21	0.0042	0	2	0.0738
HIRUDINEA	EXUVIA	3500000000	7	1519	0.3072	0	61	2.5803
HIRUDINEA RHYNCHOBDELLIDA		3501000000	.	143	0.0289	0	13	0.3573
HIRUDINEA RHYNCHOBDELLIDA	ADULT	3501000000	1	3	0.0006	0	2	0.0318
RHYNCHOBDELLIDA GLOSSIPHONIIDAE		3501010000	.	78	0.0158	0	7	0.1902
RHYNCHOBDELLIDA GLOSSIPHONIIDAE	ADULT	3501010000	1	17	0.0034	0	2	0.0619
RHYNCHOBDELLIDA GLOSSIPHONIIDAE	JUVENILE	3501010000	2	89	0.0180	0	12	0.3471
OLIGOCHAETA		3600000000	.	1134	0.2294	0	18	0.8569
OLIGOCHAETA	EXUVIA	3600000000	7	58	0.0117	0	7	0.1894
ARACHNOIDEA		3900000000	.	4	0.0008	0	1	0.0284
ARACHNOIDEA	ADULT	3900000000	1	17	0.0034	0	4	0.0816
ARACHNOIDEA	EXUVIA	3900000000	7	3	0.0006	0	2	0.0318
ARACHNOIDEA ARANEAE		3901000000	.	31	0.0063	0	2	0.0815
ARACHNOIDEA ARANEAE	ADULT	3901000000	1	4	0.0008	0	3	0.0450
ARACHNOIDEA ARANEAE	EXUVIA	3901000000	7	1	0.0002	0	1	0.0142
ARACHNOIDEA HYDRACARINA		3902000000	.	947	0.1915	0	56	1.4450
ARACHNOIDEA HYDRACARINA	ADULT	3902000000	1	509	0.1030	0	108	2.2584
ARACHNOIDEA HYDRACARINA	NYMPH	3902000000	3	3	0.0006	0	1	0.0246
ARACHNOIDEA HYDRACARINA	LARVA	3902000000	4	16	0.0032	0	9	0.1393
ARACHNOIDEA HYDRACARINA	EXUVIA	3902000000	7	11	0.0022	0	1	0.0471
HYDRACARINA HYDRACHNIDAE		3902010000	.	61	0.0123	0	3	0.1290
HYDRACARINA HYDRACHNIDAE	ADULT	3902010000	1	1	0.0002	0	1	0.0142
OXIDAE FRONTIPODA		3902020100	.	13	0.0026	0	2	0.0550
ARACHNOIDEA PHALANGIDA		3903000000	.	1	0.0002	0	1	0.0142
COPEPODA	JUVENILE	4200000000	2	1	0.0002	0	1	0.0142
COPEPODA	EXUVIA	4200000000	7	2	0.0004	0	1	0.0201
COPEPODA CALANOIDA		4201000000	.	2	0.0004	0	1	0.0201
COPEPODA CALANOIDA	ADULT	4201000000	1	5	0.0010	0	1	0.0318
COPEPODA CYCLOPOIDA		4202000000	.	19	0.0038	0	2	0.0681
COPEPODA CYCLOPOIDA	ADULT	4202000000	1	8	0.0016	0	3	0.0532
COPEPODA CYCLOPOIDA	EXUVIA	4202000000	7	1	0.0002	0	1	0.0142
CYCLOPOIDA CYCLOPIDAE		4202010000	.	1	0.0002	0	1	0.0142
COPEPODA HARPACTICOIDA		4203000000	.	59	0.0119	0	20	0.3367
BRANCHIOPODA	EXUVIA	4500000000	7	1	0.0002	0	1	0.0142

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Table 1 (cont'd)

TAXA	LIFE STAGE	----CODE----- TAXA	LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
BRANCHIOPODA CLADOCERA		4501000000	.	77	0.0156	0	8	0.2175
BRANCHIOPODA CLADOCERA	ADULT	4501000000	1	38	0.0077	0	2	0.1023
BRANCHIOPODA CLADOCERA	JUVENILE	4501000000	2	2	0.0004	0	2	0.0284
BRANCHIOPODA CLADOCERA	EXUVIA	4501000000	7	23	0.0047	0	6	0.1092
CLADOCERA SIDIDAE		4501010000	.	22	0.0044	0	3	0.0778
CLADOCERA SIDIDAE	ADULT	4501010000	1	7	0.0014	0	4	0.0620
OSTRACODA		5000000000	.	1	0.0002	0	1	0.0142
OSTRACODA PODOCOPA		5001000000	.	91	0.0184	0	5	0.1840
OSTRACODA PODOCOPA	EXUVIA	5001000000	7	3	0.0006	0	1	0.0246
MALOCOSTRACA AMPHIPODA		5502000000	.	2	0.0004	0	1	0.0201
MALOCOSTRACA AMPHIPODA	ADULT	5502000000	1	5	0.0010	0	4	0.0586
MALOCOSTRACA AMPHIPODA	JUVENILE	5502000000	2	171	0.0346	0	11	0.4241
MALOCOSTRACA AMPHIPODA	EGG	5502000000	6	544	0.1100	0	15	0.8577
MALOCOSTRACA AMPHIPODA	EXUVIA	5502000000	7	15	0.0030	0	3	0.0711
AMPHIPODA TALITRIDAE		5502010000	.	35	0.0071	0	34	0.4838
TALITRIDAE HYALLELLA		5502010100	.	2	0.0004	0	2	0.0284
HYALLELLA AZTECA		5502010101	.	22898	4.6315	0	155	10.1021
HYALLELLA AZTECA	ADULT	5502010101	1	924	0.1869	0	341	5.7932
HYALLELLA AZTECA	JUVENILE	5502010101	2	130	0.0263	0	36	0.7149
HYALLELLA AZTECA	EGG	5502010101	6	2	0.0004	0	2	0.0284
HYALLELLA AZTECA	EXUVIA	5502010101	7	102	0.0206	0	28	0.6490
AMPHIPODA GAMMARIDAE		5502020000	.	62	0.0125	0	5	0.1617
GAMMARIDAE CRANGONYX		5502020100	.	365	0.0738	0	10	0.4286
GAMMARIDAE CRANGONYX	ADULT	5502020100	1	1	0.0002	0	1	0.0142
GAMMARIDAE CRANGONYX	JUVENILE	5502020100	2	1	0.0002	0	1	0.0142
GAMMARIDAE CRANGONYX	EXUVIA	5502020100	7	3	0.0006	0	1	0.0246
CHILOPODA LITHOBIOMORPHA		5601000000	.	2	0.0004	0	1	0.0201
INSECTA		6000000000	.	9	0.0018	0	2	0.0513
INSECTA	LARVA	6000000000	4	1	0.0002	0	1	0.0142
INSECTA	EXUVIA	6000000000	7	205	0.0415	0	56	0.8587
INSECTA EPHEMEROPTERA	NYMPH	6001000000	3	58	0.0117	0	10	0.2360
INSECTA EPHEMEROPTERA	EXUVIA	6001000000	7	517	0.1046	0	10	0.8676
EPHEMEROPTERA SIPHLONURIDAE	NYMPH	6001010000	3	73	0.0148	0	13	0.2698
EPHEMEROPTERA SIPHLONURIDAE	EXUVIA	6001010000	7	24	0.0049	0	10	0.2041
SIPHLONURIDAE AMELETUS	NYMPH	6001010100	3	1	0.0002	0	1	0.0142
SIPHLONURIDAE SIPHLONURUS	NYMPH	6001010200	3	9	0.0018	0	1	0.0426
SIPHLONURIDAE SIPHLONURUS	EXUVIA	6001010200	7	1	0.0002	0	1	0.0142
EPHEMEROPTERA BAETIDAE	ADULT	6001020000	1	7	0.0014	0	3	0.0551
EPHEMEROPTERA BAETIDAE	NYMPH	6001020000	3	382	0.0773	0	135	1.9955
EPHEMEROPTERA BAETIDAE	EXUVIA	6001020000	7	60	0.0121	0	10	0.2581
BAETIDAE BAETIS	ADULT	6001020100	1	1	0.0002	0	1	0.0142
BAETIDAE BAETIS	NYMPH	6001020100	3	51	0.0103	0	6	0.1756
BAETIDAE BAETIS	EXUVIA	6001020100	7	2	0.0004	0	2	0.0284
BAETIS FLAVISTRIGA	NYMPH	6001020101	3	2	0.0004	0	1	0.0201
BAETIS MACDUNNOUGHI	NYMPH	6001020102	3	1	0.0002	0	1	0.0142
BAETIS PYGMAEUS	ADULT	6001020103	1	2	0.0004	0	1	0.0201
BAETIS PYGMAEUS	NYMPH	6001020103	3	177	0.0358	0	22	0.4330
BAETIS PYGMAEUS	EXUVIA	6001020103	7	2	0.0004	0	1	0.0201
BAETIS TRICAUDATUS	NYMPH	6001020104	3	9	0.0018	0	3	0.0551

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Table 1 (cont'd)

TAXA	LIFE STAGE	CODE TAXA	CODE LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
BAETIS TRICAUDATUS	EXUVIA	6001020104	7	1	0.0002	0	1	0.0142
EPHEMEROPTERA HEPTAGENIIDAE	ADULT	6001030000	1	1	0.0002	0	1	0.0142
EPHEMEROPTERA HEPTAGENIIDAE	NYMPH	6001030000	3	112	0.0227	0	6	0.2326
EPHEMEROPTERA HEPTAGENIIDAE	EXUVIA	6001030000	7	134	0.0271	0	10	0.4315
HEPTAGENIIDAE HEPTAGENIA	NYMPH	6001030200	3	6	0.0012	0	2	0.0402
HEPTAGENIIDAE STENONEMA	NYMPH	6001030400	3	1549	0.3133	0	46	2.2935
HEPTAGENIIDAE STENONEMA	EXUVIA	6001030400	7	2	0.0004	0	1	0.0201
STENONEMA FEMORATUM	NYMPH	6001030401	3	1435	0.2903	0	71	3.1906
STENONEMA FEMORATUM	EXUVIA	6001030401	7	6	0.0012	0	1	0.0348
STENONEMA VICARIUM	ADULT	6001030402	1	1	0.0002	0	1	0.0142
STENONEMA VICARIUM	NYMPH	6001030402	3	527	0.1066	0	25	0.8540
STENONEMA VICARIUM	EXUVIA	6001030402	7	28	0.0057	0	3	0.0920
EPHEMEROPTERA LEPTOPHLEBIIDAE	ADULT	6001040000	1	20	0.0040	0	9	0.1407
EPHEMEROPTERA LEPTOPHLEBIIDAE	NYMPH	6001040000	3	4033	0.8157	0	92	4.3908
EPHEMEROPTERA LEPTOPHLEBIIDAE	EXUVIA	6001040000	7	258	0.0522	0	10	0.6119
LEPTOPHLEBIIDAE HABROPHLEBIA	NYMPH	6001040100	3	23	0.0047	0	4	0.0974
HABROPHLEBIA VIBRANS	NYMPH	6001040101	3	996	0.2015	0	43	1.5603
HABROPHLEBIA VIBRANS	EXUVIA	6001040101	7	3	0.0006	0	2	0.0318
LEPTOPHLEBIIDAE LEPTOPHLEBIA	NYMPH	6001040200	3	132	0.0267	0	16	0.4440
LEPTOPHLEBIIDAE LEPTOPHLEBIA	EXUVIA	6001040200	7	1	0.0002	0	1	0.0142
LEPTOPHLEBIA CUPIDA	NYMPH	6001040201	3	3259	0.6592	0	85	3.9317
LEPTOPHLEBIA CUPIDA	EXUVIA	6001040201	7	14	0.0028	0	2	0.0568
LEPTOPHLEBIIDAE PARALEPTOPHLEBIA	ADULT	6001040300	1	2	0.0004	0	2	0.0284
LEPTOPHLEBIIDAE PARALEPTOPHLEBIA	NYMPH	6001040300	3	9239	1.8687	0	277	12.9296
LEPTOPHLEBIIDAE PARALEPTOPHLEBIA	EXUVIA	6001040300	7	1	0.0002	0	1	0.0142
PARALEPTOPHLEBIA ADOPTIVA	NYMPH	6001040301	3	388	0.0785	0	18	0.6530
PARALEPTOPHLEBIA ADOPTIVA	EXUVIA	6001040301	7	6	0.0012	0	1	0.0348
PARALEPTOPHLEBIA DEBILIS	NYMPH	6001040302	3	101	0.0204	0	6	0.2324
PARALEPTOPHLEBIA DEBILIS	EXUVIA	6001040302	7	3	0.0006	0	1	0.0246
EPHEMEROPTERA EPHEMERELLIDAE	ADULT	6001050000	1	5	0.0010	0	1	0.0318
EPHEMEROPTERA EPHEMERELLIDAE	NYMPH	6001050000	3	573	0.1159	0	18	0.6992
EPHEMEROPTERA EPHEMERELLIDAE	EXUVIA	6001050000	7	26	0.0053	0	5	0.1255
EPHEMERELLIDAE DRUNELLA	NYMPH	6001050100	3	2	0.0004	0	2	0.0284
EPHEMERELLIDAE EPHEMERELLA	NYMPH	6001050200	3	351	0.0710	0	16	0.5774
EPHEMERELLA SUBVARIA	ADULT	6001050202	1	1	0.0002	0	1	0.0142
EPHEMERELLA SUBVARIA	NYMPH	6001050202	3	39	0.0079	0	3	0.1071
EPHEMERELLA SUBVARIA	EXUVIA	6001050202	7	4	0.0008	0	1	0.0284
EPHEMERELLIDAE EURYLOPHELLA	NYMPH	6001050300	3	163	0.0330	0	28	0.6573
EURYLOPHELLA FUNERALIS	NYMPH	6001050301	3	22	0.0044	0	9	0.1436
EURYLOPHELLA PRUDENTALIS	NYMPH	6001050302	3	834	0.1687	0	23	0.8526
EURYLOPHELLA PRUDENTALIS	EXUVIA	6001050302	7	3	0.0006	0	1	0.0246
EPHEMEROPTERA CAENIDAE	ADULT	6001070000	1	3	0.0006	0	2	0.0318
EPHEMEROPTERA CAENIDAE	NYMPH	6001070000	3	81	0.0164	0	5	0.1853
EPHEMEROPTERA CAENIDAE	EXUVIA	6001070000	7	36	0.0073	0	10	0.2146
CAENIDAE CAENIS	NYMPH	6001070100	3	259	0.0524	0	38	0.6047
CAENIDAE CAENIS	EXUVIA	6001070100	7	19	0.0038	0	3	0.0738
CAENIS SIMULANS	NYMPH	6001070101	3	37	0.0075	0	2	0.0951
CAENIS SIMULANS	EXUVIA	6001070101	7	33	0.0067	0	6	0.1414
EPHEMEROPTERA EPHEMERIDAE	NYMPH	6001080000	3	58	0.0117	0	6	0.1580

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Table 1 (cont'd)

TAXA	LIFE STAGE	----CODE---- TAXA	LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
EPHEMEROPTERA EPHEMERIDAE	EXUVIA	6001080000	7	6	0.0012	0	1	0.0348
EPHEMERIDAE HEXAGENIA	NYMPH	6001080100	3	99	0.0200	0	7	0.2115
EPHEMERIDAE HEXAGENIA	EXUVIA	6001080100	7	12	0.0024	0	2	0.0603
INSECTA ODONATA	NYMPH	6002000000	3	2	0.0004	0	1	0.0201
INSECTA ODONATA	EXUVIA	6002000000	7	25	0.0051	0	3	0.0909
INSECTA ZYGOPTERA	NYMPH	6003000000	3	2	0.0004	0	1	0.0201
INSECTA ZYGOPTERA	EXUVIA	6003000000	7	1	0.0002	0	1	0.0142
ZYGOPTERA CALOPTERYGIDAE	NYMPH	6003010000	3	1	0.0002	0	1	0.0142
CALOPTERYX AEQUABILIS	NYMPH	6003010101	3	5	0.0010	0	1	0.0318
ZYGOPTERA LESTIDAE	NYMPH	6003020000	3	1	0.0002	0	1	0.0142
ZYGOPTERA COENAGRIIDAE	NYMPH	6003030000	3	190	0.0384	0	3	0.2252
ZYGOPTERA COENAGRIIDAE	EXUVIA	6003030000	7	29	0.0059	0	10	0.1676
COENAGRIIDAE NEHALENNIA	NYMPH	6003030100	3	1	0.0002	0	1	0.0142
COENAGRIIDAE COENAGRION	NYMPH	6003030200	3	2	0.0004	0	1	0.0201
COENAGRIIDAE ISCHNURA	NYMPH	6003030400	3	35	0.0071	0	3	0.1109
COENAGRIIDAE ISCHNURA	EXUVIA	6003030400	7	4	0.0008	0	2	0.0348
INSECTA ANISOPTERA	NYMPH	6004000000	3	6	0.0012	0	2	0.0450
INSECTA ANISOPTERA	EXUVIA	6004000000	7	2	0.0004	0	1	0.0201
ANISOPTERA AESHNIDAE	NYMPH	6004010000	3	329	0.0665	0	5	0.3228
ANISOPTERA AESHNIDAE	EXUVIA	6004010000	7	17	0.0034	0	3	0.0765
AESHNIDAE AESHNA	NYMPH	6004010100	3	198	0.0400	0	7	0.2699
AESHNIDAE AESHNA	EXUVIA	6004010100	7	41	0.0083	0	2	0.0951
ANISOPTERA GOMPHIDAE	NYMPH	6004020000	3	5	0.0010	0	3	0.0472
OPHIOGOMPHUS COLUBRINUS	NYMPH	6004020101	3	6	0.0012	0	1	0.0348
OPHIOGOMPHUS COLUBRINUS	EXUVIA	6004020101	7	1	0.0002	0	1	0.0142
ANISOPTERA CORDULIIDAE	ADULT	6004030000	1	2	0.0004	0	1	0.0201
ANISOPTERA CORDULIIDAE	NYMPH	6004030000	3	112	0.0227	0	3	0.1862
ANISOPTERA CORDULIIDAE	EXUVIA	6004030000	7	14	0.0028	0	2	0.0603
CORDULIIDAE CORDULIA	NYMPH	6004030100	3	1	0.0002	0	1	0.0142
CORDULIA SHURTLEFFI	NYMPH	6004030101	3	31	0.0063	0	6	0.1214
CORDULIIDAE SOMATOCHLORA	NYMPH	6004030200	3	71	0.0144	0	4	0.1422
CORDULIIDAE SOMATOCHLORA	EXUVIA	6004030200	7	5	0.0010	0	1	0.0318
ANISOPTERA LIBELLULIDAE	NYMPH	6004040000	3	540	0.1092	0	7	0.4509
ANISOPTERA LIBELLULIDAE	EXUVIA	6004040000	7	21	0.0042	0	1	0.0650
LIBELLULIDAE LEUCORRHINIA	NYMPH	6004040100	3	1	0.0002	0	1	0.0142
LIBELLULIDAE LIBELLULA	NYMPH	6004040200	3	25	0.0051	0	3	0.0909
LIBELLULA QUADRIMACULATA	NYMPH	6004040201	3	1	0.0002	0	1	0.0142
LIBELLULIDAE SYMPETRUM	NYMPH	6004040400	3	1	0.0002	0	1	0.0142
INSECTA PLECOPTERA	ADULT	6005000000	1	2	0.0004	0	1	0.0201
INSECTA PLECOPTERA	NYMPH	6005000000	3	17	0.0034	0	4	0.0841
INSECTA PLECOPTERA	EXUVIA	6005000000	7	26	0.0053	0	5	0.1172
PLECOPTERA LEUCTRIDAE	ADULT	6005010000	1	11	0.0022	0	3	0.0586
PLECOPTERA LEUCTRIDAE	NYMPH	6005010000	3	47	0.0095	0	13	0.2474
PLECOPTERA LEUCTRIDAE	EXUVIA	6005010000	7	23	0.0047	0	10	0.2036
LEUCTRIDAE LEUCTRA	ADULT	6005010100	1	2	0.0004	0	1	0.0201
LEUCTRIDAE LEUCTRA	NYMPH	6005010100	3	2	0.0004	0	1	0.0201
LEUCTRIDAE LEUCTRA	EXUVIA	6005010100	7	1	0.0002	0	1	0.0142
LEUCTRA FERRUGINEA	ADULT	6005010101	1	1	0.0002	0	1	0.0142
LEUCTRA FERRUGINEA	NYMPH	6005010101	3	256	0.0518	0	8	0.3797

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Table 1 (cont'd)

TAXA	LIFE STAGE	CODE TAXA	CODE LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
LEUCTRA FERRUGINEA	PUPA	6005010101	5	1	0.0002	0	1	0.0142
LEUCTRA FERRUGINEA	EXUVIA	6005010101	7	5	0.0010	0	1	0.0318
LEUCTRA TRUNCATA	NYMPH	6005010102	3	2	0.0004	0	1	0.0201
PLECOPTERA CAPNIIDAE	ADULT	6005020000	1	1	0.0002	0	1	0.0142
PLECOPTERA CAPNIIDAE	NYMPH	6005020000	3	5	0.0010	0	1	0.0318
PLECOPTERA NEMOURIDAE	ADULT	6005030000	1	7	0.0014	0	5	0.0739
PLECOPTERA NEMOURIDAE	NYMPH	6005030000	3	2	0.0004	0	1	0.0201
PLECOPTERA NEMOURIDAE	EXUVIA	6005030000	7	4	0.0008	0	3	0.0450
NEMOURIDAE NEMOURA	EXUVIA	6005030100	7	1	0.0002	0	1	0.0142
NEMOURA MACDUNNOUGHI	ADULT	6005030101	1	1	0.0002	0	1	0.0142
NEMOURA MACDUNNOUGHI	NYMPH	6005030101	3	79	0.0160	0	19	0.3547
NEMOURA MACDUNNOUGHI	EXUVIA	6005030101	7	1	0.0002	0	1	0.0142
PLECOPTERA CHLOROPERLIDAE	NYMPH	6005040000	3	194	0.0392	0	18	0.5030
PLECOPTERA PERLODIDAE	ADULT	6005060000	1	3	0.0006	0	1	0.0246
PLECOPTERA PERLODIDAE	NYMPH	6005060000	3	128	0.0259	0	12	0.3684
PLECOPTERA PERLODIDAE	EXUVIA	6005060000	7	24	0.0049	0	10	0.1670
PERLODIDAE ISOPERLA	NYMPH	6005060200	3	27	0.0055	0	7	0.1231
ISOPERLA TRANSMARINA	ADULT	6005060202	1	2	0.0004	0	1	0.0201
ISOPERLA TRANSMARINA	NYMPH	6005060202	3	81	0.0164	0	4	0.1693
ISOPERLA TRANSMARINA	EXUVIA	6005060202	7	9	0.0018	0	1	0.0426
PLECOPTERA TAENIOPTERYGIDAE	NYMPH	6005070000	3	4	0.0008	0	1	0.0284
INSECTA HEMIPTERA	ADULT	6006000000	1	20	0.0040	0	2	0.0696
INSECTA HEMIPTERA	NYMPH	6006000000	3	13	0.0026	0	4	0.0711
INSECTA HEMIPTERA	EXUVIA	6006000000	7	4	0.0008	0	1	0.0284
HEMIPTERA CORIXIDAE	ADULT	6006010000	1	74	0.0150	0	8	0.2161
HEMIPTERA CORIXIDAE	NYMPH	6006010000	3	18	0.0036	0	6	0.1025
HEMIPTERA CORIXIDAE	EXUVIA	6006010000	7	21	0.0042	0	5	0.1128
HEMIPTERA NOTONECTIDAE	ADULT	6006020000	1	7	0.0014	0	7	0.0996
HEMIPTERA NOTONECTIDAE	EXUVIA	6006020000	7	1	0.0002	0	1	0.0142
BELOSTOMATIDAE LETHOCERUS	NYMPH	6006030100	3	1	0.0002	0	1	0.0142
HEMIPTERA MESOVELIIDAE	ADULT	6006040000	1	1	0.0002	0	1	0.0142
VELIIDAE MICROVELIA	NYMPH	6006050100	3	1	0.0002	0	1	0.0142
HEMIPTERA GERRIDAE	ADULT	6006060000	1	16	0.0032	0	3	0.0829
HEMIPTERA GERRIDAE	NYMPH	6006060000	3	5	0.0010	0	2	0.0427
HEMIPTERA GERRIDAE	EXUVIA	6006060000	7	5	0.0010	0	1	0.0318
GERRIDAE GERRIS	NYMPH	6006060100	3	3	0.0006	0	1	0.0246
GERRIDAE GERRIS	EXUVIA	6006060100	7	1	0.0002	0	1	0.0142
HEMIPTERA REDUVIIDAE	ADULT	6006080000	1	2	0.0004	0	2	0.0284
HEMIPTERA MIRIDAE	EXUVIA	6006090000	7	2	0.0004	0	2	0.0284
INSECTA NEUROPTERA	LARVA	6007000000	4	2	0.0004	0	2	0.0284
NEUROPTERA SISYRIDAE	LARVA	6007010000	4	10	0.0020	0	1	0.0449
SISYRIDAE CLIMACIA	LARVA	6007010100	4	2	0.0004	0	1	0.0201
NEUROPTERA HEMEROBIIDAE	ADULT	6007020000	1	1	0.0002	0	1	0.0142
INSECTA COLEOPTERA	ADULT	6008000000	1	75	0.0152	0	5	0.1557
INSECTA COLEOPTERA	LARVA	6008000000	4	4	0.0008	0	1	0.0284
INSECTA COLEOPTERA	EXUVIA	6008000000	7	8	0.0016	0	1	0.0402
COLEOPTERA HALIPLIDAE	ADULT	6008010000	1	10	0.0020	0	5	0.0779
HALIPLIDAE HALIPLUS	ADULT	6008010100	1	2	0.0004	0	1	0.0201
HALIPLIDAE HALIPLUS	LARVA	6008010100	4	2	0.0004	0	1	0.0201

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Table 1 (cont'd)

TAXA	LIFE STAGE	----CODE----- TAXA	LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
COLEOPTERA DYTISCIDAE	ADULT	6008020000	1	46	0.0093	0	7	0.1607
COLEOPTERA DYTISCIDAE	LARVA	6008020000	4	67	0.0136	0	4	0.1479
COLEOPTERA DYTISCIDAE	EXUVIA	6008020000	7	9	0.0018	0	2	0.0471
LIODESSUS AFFINIS	ADULT	6008020101	1	1	0.0002	0	1	0.0142
DYTISCIDAE HYDROPORUS	ADULT	6008020500	1	5	0.0010	0	1	0.0318
DYTISCIDAE ILYBIUS	ADULT	6008020700	1	1	0.0002	0	1	0.0142
COLEOPTERA GYRINIDAE	ADULT	6008030000	1	20	0.0040	0	4	0.0964
COLEOPTERA GYRINIDAE	LARVA	6008030000	4	4	0.0008	0	1	0.0284
GYRINIDAE GYRINUS	ADULT	6008030100	1	1	0.0002	0	1	0.0142
GYRINIDAE GYRINUS	LARVA	6008030100	4	1	0.0002	0	1	0.0142
COLEOPTERA HYDROPHILIDAE	ADULT	6008040000	1	2	0.0004	0	1	0.0201
COLEOPTERA HELODIDAE	ADULT	6008050000	1	2	0.0004	0	1	0.0201
COLEOPTERA HELODIDAE	LARVA	6008050000	4	3	0.0006	0	1	0.0246
COLEOPTERA HELODIDAE	EXUVIA	6008050000	7	1	0.0002	0	1	0.0142
COLEOPTERA ELMIDAE	ADULT	6008060000	1	294	0.0595	0	18	0.5292
COLEOPTERA ELMIDAE	LARVA	6008060000	4	134	0.0271	0	41	0.7626
COLEOPTERA ELMIDAE	EXUVIA	6008060000	7	10	0.0020	0	4	0.0667
PROMORESIA TARDELLA	ADULT	6008060201	1	15	0.0030	0	2	0.0651
PROMORESIA TARDELLA	LARVA	6008060201	4	36	0.0073	0	2	0.0983
PROMORESIA TARDELLA	EXUVIA	6008060201	7	1	0.0002	0	1	0.0142
ELMIDAE STENELMIS	ADULT	6008060300	1	40	0.0081	0	3	0.1080
ELMIDAE STENELMIS	LARVA	6008060300	4	164	0.0332	0	7	0.2861
ELMIDAE STENELMIS	EXUVIA	6008060300	7	17	0.0034	0	2	0.0619
STENELMIS CRENATA	ADULT	6008060301	1	32	0.0065	0	2	0.0920
STENELMIS CRENATA	LARVA	6008060301	4	164	0.0332	0	8	0.2882
STENELMIS CRENATA	EXUVIA	6008060301	7	24	0.0049	0	2	0.0751
COLEOPTERA CHRYSOMELIDAE	ADULT	6008070000	1	8	0.0016	0	2	0.0449
COLEOPTERA CHRYSOMELIDAE	LARVA	6008070000	4	1	0.0002	0	1	0.0142
COLEOPTERA CHRYSOMELIDAE	PUPA	6008070000	5	2	0.0004	0	1	0.0201
COLEOPTERA CHRYSOMELIDAE	EXUVIA	6008070000	7	1	0.0002	0	1	0.0142
CHRYSOMELIDAE DONACIA	LARVA	6008070100	4	9	0.0018	0	2	0.0471
CHRYSOMELIDAE DONACIA	EXUVIA	6008070100	7	2	0.0004	0	1	0.0201
COLEOPTERA ELATERIDAE	ADULT	6008080000	1	1	0.0002	0	1	0.0142
COLEOPTERA CURCULIONIDAE	ADULT	6008090000	1	11	0.0022	0	2	0.0550
COLEOPTERA CURCULIONIDAE	LARVA	6008090000	4	1	0.0002	0	1	0.0142
COLEOPTERA CURCULIONIDAE	EXUVIA	6008090000	7	1	0.0002	0	1	0.0142
COLEOPTERA STAPHYLINIDAE	ADULT	6008100000	1	12	0.0024	0	1	0.0492
COLEOPTERA STAPHYLINIDAE	EXUVIA	6008100000	7	1	0.0002	0	1	0.0142
COLEOPTERA LATHRIDIIDAE	ADULT	6008110000	1	8	0.0016	0	1	0.0402
COLEOPTERA DRYOPOIDAE	ADULT	6008120000	1	1	0.0002	0	1	0.0142
COLEOPTERA CANTHARIDAE	EXUVIA	6008130000	7	1	0.0002	0	1	0.0142
COLEOPTERA SCOLYTIDAE	ADULT	6008140000	1	1	0.0002	0	1	0.0142
COLEOPTERA CRYPTOPHAGIDAE	LARVA	6008150000	4	1	0.0002	0	1	0.0142
COLEOPTERA CARABIDAE	EXUVIA	6008160000	7	1	0.0002	0	1	0.0142
DERMESTIDAE DERMESTES	ADULT	6008170100	1	1	0.0002	0	1	0.0142
INSECTA TRICHOPTERA	ADULT	6009000000	1	6	0.0012	0	2	0.0402
INSECTA TRICHOPTERA	LARVA	6009000000	4	37	0.0075	0	5	0.1294
INSECTA TRICHOPTERA	PUPA	6009000000	5	34	0.0069	0	6	0.1741
INSECTA TRICHOPTERA	EXUVIA	6009000000	7	369	0.0746	0	48	0.7959

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Table 1 (cont'd)

TAXA	LIFE STAGE	CODE TAXA	CODE LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
TRICHOPTERA RHYACOPHILIDAE	LARVA	6009010000	4	14	0.0028	0	3	0.0752
TRICHOPTERA RHYACOPHILIDAE	PUPA	6009010000	5	9	0.0018	0	9	0.1280
RHYACOPHILIDAE RHYACOPHILA	LARVA	6009010100	4	40	0.0081	0	3	0.1117
RHYACOPHILIDAE RHYACOPHILA	PUPA	6009010100	5	3	0.0006	0	1	0.0246
TRICHOPTERA GLOSSOSOMATIDAE	EXUVIA	6009020000	7	1	0.0002	0	1	0.0142
TRICHOPTERA PHILOPOTAMIDAE	ADULT	6009030000	1	17	0.0034	0	7	0.1248
TRICHOPTERA PHILOPOTAMIDAE	LARVA	6009030000	4	85	0.0172	0	27	0.4848
TRICHOPTERA PHILOPOTAMIDAE	EXUVIA	6009030000	7	12	0.0024	0	10	0.1436
DOLOPHILODES DISTINCTUS	LARVA	6009030101	4	243	0.0492	0	92	1.6951
DOLOPHILODES DISTINCTUS	PUPA	6009030101	5	2	0.0004	0	1	0.0201
PHILOPOTOMIDAE CHIMARRA	LARVA	6009030200	4	734	0.1485	0	95	2.3237
PHILOPOTOMIDAE CHIMARRA	PUPA	6009030200	5	4	0.0008	0	2	0.0402
TRICHOPTERA POLYCENTROPODIDAE	ADULT	6009040000	1	5	0.0010	0	3	0.0472
TRICHOPTERA POLYCENTROPODIDAE	LARVA	6009040000	4	234	0.0473	0	17	0.4855
TRICHOPTERA POLYCENTROPODIDAE	PUPA	6009040000	5	3	0.0006	0	1	0.0246
TRICHOPTERA POLYCENTROPODIDAE	EXUVIA	6009040000	7	6	0.0012	0	2	0.0402
POLYCENTROPODIDAE NEURECLIPSIS	LARVA	6009040100	4	1055	0.2134	0	158	3.1976
POLYCENTROPODIDAE NYCTIOPHYLAX	LARVA	6009040200	4	198	0.0400	0	19	0.5930
POLYCENTROPODIDAE POLYCENTROPUS	LARVA	6009040300	4	4254	0.8604	0	200	7.8208
TRICHOPTERA HYDROPSYCHIDAE	ADULT	6009050000	1	22	0.0044	0	3	0.0828
TRICHOPTERA HYDROPSYCHIDAE	LARVA	6009050000	4	3457	0.6992	0	486	11.9307
TRICHOPTERA HYDROPSYCHIDAE	PUPA	6009050000	5	29	0.0059	0	4	0.1163
TRICHOPTERA HYDROPSYCHIDAE	EXUVIA	6009050000	7	66	0.0133	0	11	0.2834
HYDROPSYCHIDAE HYDROPSYCHE	ADULT	6009050300	1	1	0.0002	0	1	0.0142
HYDROPSYCHIDAE HYDROPSYCHE	LARVA	6009050300	4	603	0.1220	0	76	1.9075
HYDROPSYCHIDAE HYDROPSYCHE	EXUVIA	6009050300	7	1	0.0002	0	1	0.0142
HYDROPSYCHE BETTENI	LARVA	6009050301	4	117	0.0237	0	13	0.3175
HYDROPSYCHE SPARNA	LARVA	6009050302	4	262	0.0530	0	18	0.4989
HYDROPSYCHE RECURVATA	LARVA	6009050303	4	247	0.0500	0	35	0.7413
HYDROPSYCHE SLOSSONAE	LARVA	6009050304	4	186	0.0376	0	25	0.5986
HYDROPSYCHIDAE CHEUMATOPSYCHE	LARVA	6009050400	4	233	0.0471	0	76	1.2839
CHEUMATOPSYCHE PETTITI	ADULT	6009050401	1	5	0.0010	0	1	0.0318
CHEUMATOPSYCHE PETTITI	LARVA	6009050401	4	2600	0.5259	0	316	6.5141
CHEUMATOPSYCHE PETTITI	PUPA	6009050401	5	1	0.0002	0	1	0.0142
TRICHOPTERA HYDROPTILIDAE	ADULT	6009060000	1	6	0.0012	0	2	0.0402
TRICHOPTERA HYDROPTILIDAE	LARVA	6009060000	4	240	0.0485	0	62	1.0398
TRICHOPTERA HYDROPTILIDAE	PUPA	6009060000	5	2	0.0004	0	1	0.0201
TRICHOPTERA HYDROPTILIDAE	EXUVIA	6009060000	7	2	0.0004	0	1	0.0201
HYDROPTILIDAE HYDROPTILA	ADULT	6009060100	1	1	0.0002	0	1	0.0142
HYDROPTILIDAE HYDROPTILA	LARVA	6009060100	4	40	0.0081	0	5	0.1254
HYDROPTILIDAE OXYETHIRA	ADULT	6009060200	1	2	0.0004	0	1	0.0201
HYDROPTILIDAE OXYETHIRA	LARVA	6009060200	4	266	0.0538	0	19	0.5667
HYDROPTILIDAE OXYETHIRA	PUPA	6009060200	5	3	0.0006	0	1	0.0246
HYDROPTILIDAE OXYETHIRA	EXUVIA	6009060200	7	81	0.0164	0	4	0.1632
HYDROPTILIDAE AGRAYLEA	LARVA	6009060300	4	22	0.0044	0	6	0.1189
TRICHOPTERA PSYCHOMYIIDAE	ADULT	6009070000	1	1	0.0002	0	1	0.0142
TRICHOPTERA PSYCHOMYIIDAE	LARVA	6009070000	4	4	0.0008	0	4	0.0569
TRICHOPTERA PHRYGANEIDAE	ADULT	6009080000	1	1	0.0002	0	1	0.0142
TRICHOPTERA PHRYGANEIDAE	LARVA	6009080000	4	116	0.0235	0	6	0.2135

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Table 1 (cont'd)

TAXA	LIFE STAGE	----CODE----- TAXA	LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
TRICHOPTERA PHRYGANEIDAE	PUPA	6009080000	5	4	0.0008	0	1	0.0284
TRICHOPTERA PHRYGANEIDAE	EXUVIA	6009080000	7	157	0.0318	0	10	0.2464
PHRYGANEIDAE PTILOSTOMIS	LARVA	6009080100	4	38	0.0077	0	3	0.1003
PHRYGANEIDAE PTILOSTOMIS	EXUVIA	6009080100	7	1	0.0002	0	1	0.0142
PHRYGANEIDAE PHRYGANEA	LARVA	6009080200	4	8	0.0016	0	1	0.0402
PHRYGANEIDAE OLIGOSTOMIS	LARVA	6009080300	4	24	0.0049	0	2	0.0724
PHRYGANEIDAE AGRYPNIA	LARVA	6009080400	4	16	0.0032	0	2	0.0603
PHRYGANEIDAE AGRYPNIA	EXUVIA	6009080400	7	3	0.0006	0	2	0.0318
PHRYGANEIDAE BANKSIOLA	LARVA	6009080500	4	18	0.0036	0	2	0.0696
PHRYGANEIDAE BANKSIOLA	EXUVIA	6009080500	7	1	0.0002	0	1	0.0142
TRICHOPTERA LIMNEPHILIDAE	ADULT	6009090000	1	2	0.0004	0	1	0.0201
TRICHOPTERA LIMNEPHILIDAE	LARVA	6009090000	4	312	0.0631	0	13	0.4816
TRICHOPTERA LIMNEPHILIDAE	PUPA	6009090000	5	9	0.0018	0	2	0.0471
TRICHOPTERA LIMNEPHILIDAE	EXUVIA	6009090000	7	39	0.0079	0	2	0.0972
LIMNEPHILIDAE NEOPHYLAX	LARVA	6009090200	4	8	0.0016	0	2	0.0449
LIMNEPHILIDAE PLATYCENTROPUS	LARVA	6009090500	4	1	0.0002	0	1	0.0142
LIMNEPHILIDAE PLATYCENTROPUS	EXUVIA	6009090500	7	1	0.0002	0	1	0.0142
LIMNEPHILIDAE NEMOTAULIUS	LARVA	6009090600	4	3	0.0006	0	1	0.0246
NEMOTAULIUS HOSTILIS	LARVA	6009090601	4	7	0.0014	0	1	0.0376
ARCTOPORA PULCHELLA	LARVA	6009090801	4	1	0.0002	0	1	0.0142
LIMNEPHILIDAE LIMNEPHILUS	LARVA	6009091100	4	49	0.0099	0	3	0.1125
LIMNEPHILIDAE ANOBOLIA	LARVA	6009091200	4	2	0.0004	0	1	0.0201
GLYPHOPSYCHE IRRORATA	LARVA	6009091301	4	8	0.0016	0	1	0.0402
LIMNEPHILIDAE PSYCHOGLYPHA	EXUVIA	6009091400	7	2	0.0004	0	2	0.0284
LIMNEPHILIDAE HYDATOPHYLAX	LARVA	6009091500	4	1	0.0002	0	1	0.0142
HYDATOPHYLAX ARGUS	LARVA	6009091501	4	3	0.0006	0	1	0.0246
LIMNEPHILIDAE PYCHNOPSYCHE	LARVA	6009091600	4	66	0.0133	0	6	0.1604
LIMNEPHILIDAE PYCHNOPSYCHE	PUPA	6009091600	5	12	0.0024	0	3	0.0725
LIMNEPHILIDAE PYCHNOPSYCHE	EXUVIA	6009091600	7	2	0.0004	0	2	0.0284
TRICHOPTERA MOLANNIDAE	LARVA	6009110000	4	4	0.0008	0	2	0.0348
TRICHOPTERA MOLANNIDAE	EXUVIA	6009110000	7	2	0.0004	0	1	0.0201
MOLANNIDAE MOLANNA	ADULT	6009110100	1	1	0.0002	0	1	0.0142
MOLANNIDAE MOLANNA	LARVA	6009110100	4	255	0.0516	0	14	0.5080
MOLANNIDAE MOLANNA	PUPA	6009110100	5	13	0.0026	0	11	0.1590
MOLANNIDAE MOLANNA	EXUVIA	6009110100	7	3	0.0006	0	1	0.0246
TRICHOPTERA LEPTOCERIDAE	LARVA	6009120000	4	682	0.1379	0	490	6.9897
TRICHOPTERA LEPTOCERIDAE	PUPA	6009120000	5	23	0.0047	0	2	0.0710
TRICHOPTERA LEPTOCERIDAE	EXUVIA	6009120000	7	374	0.0756	0	7	0.4032
LEPTOCERIDAE TRIAENODES	LARVA	6009120100	4	13	0.0026	0	2	0.0550
LEPTOCERIDAE TRIAENODES	EXUVIA	6009120100	7	2	0.0004	0	1	0.0201
LEPTOCERIDAE OECETIS	LARVA	6009120200	4	190	0.0384	0	5	0.2515
LEPTOCERIDAE OECETIS	PUPA	6009120200	5	6	0.0012	0	1	0.0348
LEPTOCERIDAE OECETIS	EXUVIA	6009120200	7	15	0.0030	0	5	0.0954
LEPTOCERIDAE MYSTACIDES	LARVA	6009120300	4	48	0.0097	0	6	0.1447
LEPTOCERIDAE MYSTACIDES	EXUVIA	6009120300	7	1	0.0002	0	1	0.0142
LEPTOCERIDAE CERACLEA	LARVA	6009120400	4	44	0.0089	0	5	0.1253
LEPTOCERIDAE CERACLEA	PUPA	6009120400	5	1	0.0002	0	1	0.0142
CERACLEA RUTHAE	LARVA	6009120406	4	1	0.0002	0	1	0.0142
TRICHOPTERA LEPIDOSTOMATIDAE	LARVA	6009130000	4	21	0.0042	0	3	0.0791

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Table 1 (cont'd)

TAXA	LIFE STAGE	CODE TAXA	CODE LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
TRICHOPTERA LEPIDOSTOMATIDAE	EXUVIA	6009130000	7	2	0.0004	0	2	0.0284
LEPIDOSTOMATIDAE LEPIDOSTOMA	ADULT	6009130100	1	1	0.0002	0	1	0.0142
LEPIDOSTOMATIDAE LEPIDOSTOMA	LARVA	6009130100	4	210	0.0425	0	8	0.3139
LEPIDOSTOMATIDAE LEPIDOSTOMA	PUPA	6009130100	5	5	0.0010	0	1	0.0318
TRICHOPTERA BRACHYCENTRIDAE	EXUVIA	6009130100	7	6	0.0012	0	2	0.0402
TRICHOPTERA BRACHYCENTRIDAE	LARVA	6009140000	4	1	0.0002	0	1	0.0142
TRICHOPTERA HELICOPSYCHIDAE	EXUVIA	6009140000	7	3	0.0006	0	2	0.0318
HELICOPSYCHIDAE HELICOPSYCHE	EXUVIA	6009150000	7	1	0.0002	0	1	0.0142
HELICOPSYCHIDAE HELICOPSYCHE	LARVA	6009150100	4	2	0.0004	0	1	0.0201
HELICOPSYCHE BOREALIS	EXUVIA	6009150100	7	8	0.0016	0	1	0.0402
INSECTA DIPTERA	LARVA	6009150101	4	1	0.0002	0	1	0.0142
INSECTA DIPTERA	ADULT	6010000000	1	40	0.0081	0	3	0.1099
INSECTA DIPTERA	LARVA	6010000000	4	12	0.0024	0	4	0.0725
INSECTA DIPTERA	PUPA	6010000000	5	181	0.0366	0	65	0.9824
DIPTERA TIPULIDAE	EXUVIA	6010000000	7	712	0.1440	0	13	1.0033
DIPTERA TIPULIDAE	ADULT	6010010000	1	2	0.0004	0	1	0.0201
DIPTERA TIPULIDAE	LARVA	6010010000	4	33	0.0067	0	12	0.2045
TIPULIDAE ANTOCHA	EXUVIA	6010010000	7	3	0.0006	0	1	0.0246
TIPULIDAE ANTOCHA	LARVA	6010010100	4	18	0.0036	0	2	0.0666
TIPULIDAE DICRANOTA	EXUVIA	6010010100	7	1	0.0002	0	1	0.0142
TIPULIDAE HEXATOMA	LARVA	6010010400	4	2	0.0004	0	1	0.0201
HEXATOMA BRACHYCERA	LARVA	6010010800	4	3	0.0006	0	2	0.0318
HEXATOMA BRACHYCERA	ADULT	6010010801	1	1	0.0002	0	1	0.0142
TIPULIDAE LIMNOPHILA	EXUVIA	6010010801	7	1	0.0002	0	1	0.0142
TIPULIDAE PSEUDOLIMNOPHILA	LARVA	6010010900	4	1	0.0002	0	1	0.0142
TIPULIDAE TIPULA	LARVA	6010011900	4	2	0.0004	0	2	0.0284
DIPTERA DIXIDAE	LARVA	6010012300	4	1	0.0002	0	1	0.0142
DIXIDAE DIXELLA	LARVA	6010040000	4	5	0.0010	0	1	0.0318
DIPTERA CHAOBORIDAE	LARVA	6010040200	4	1	0.0002	0	1	0.0142
DIPTERA CULICIDAE	LARVA	6010050000	4	2	0.0004	0	1	0.0201
DIPTERA CERATOPOGONIDAE	ADULT	6010060000	1	3	0.0006	0	1	0.0246
DIPTERA CERATOPOGONIDAE	ADULT	6010070000	1	35	0.0071	0	23	0.3434
DIPTERA CERATOPOGONIDAE	LARVA	6010070000	4	1796	0.3633	0	237	4.6165
DIPTERA CERATOPOGONIDAE	PUPA	6010070000	5	359	0.0726	0	279	4.0479
CERATOPOGONIDAE CULICOIDES	EXUVIA	6010070000	7	22	0.0044	0	10	0.2021
DIPTERA CHIRONOMIDAE	LARVA	6010070100	4	1	0.0002	0	1	0.0142
DIPTERA CHIRONOMIDAE	ADULT	6010080000	1	701	0.1418	0	353	5.0794
DIPTERA CHIRONOMIDAE	LARVA	6010080000	4	17357	3.5107	0	376	9.9503
DIPTERA CHIRONOMIDAE	PUPA	6010080000	5	472	0.0955	0	58	1.1447
DIPTERA CHIRONOMIDAE	EGG	6010080000	6	3	0.0006	0	3	0.0427
CHIRONOMIDAE CRYTOCHIRONOMUS	EXUVIA	6010080000	7	1466	0.2965	0	62	1.8125
DIPTERA SIMULIIDAE	PUPA	6010080700	5	3	0.0006	0	1	0.0246
DIPTERA SIMULIIDAE	ADULT	6010090000	1	201	0.0407	0	129	1.8891
DIPTERA SIMULIIDAE	LARVA	6010090000	4	20126	4.0708	0	6467	132.5727
DIPTERA SIMULIIDAE	PUPA	6010090000	5	184	0.0372	0	40	1.0057
SIMULIIDAE PROSIMULIUM	EXUVIA	6010090000	7	212	0.0429	0	10	0.5948
PROSIMULIUM MIXTUM	EXUVIA	6010090100	7	1	0.0002	0	1	0.0142
PROSIMULIUM MIXTUM	ADULT	6010090102	1	3	0.0006	0	1	0.0246
	PUPA	6010090102	5	1	0.0002	0	1	0.0142

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Table 1 (cont'd)

TAXA	LIFE STAGE	CODE TAXA	CODE LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
PROSIMULIUM MIXTUM	EXUVIA	6010090102	7	24	0.0049	0	4	0.0984
STEGOPTERNA MUTATA	ADULT	6010090201	1	1	0.0002	0	1	0.0142
STEGOPTERNA MUTATA	EXUVIA	6010090201	7	38	0.0077	0	10	0.1797
SIMULIIDAE EUSIMULIUM	ADULT	6010090400	1	2	0.0004	0	1	0.0201
SIMULIIDAE EUSIMULIUM	LARVA	6010090400	4	53	0.0107	0	17	0.3065
SIMULIIDAE EUSIMULIUM	EXUVIA	6010090400	7	1	0.0002	0	1	0.0142
EUSIMULIUM VERNUM	LARVA	6010090409	4	2	0.0004	0	1	0.0201
EUSIMULIUM CONGAREENARUM	LARVA	6010090410	4	18	0.0036	0	5	0.0899
SIMULIIDAE SIMULIUM	ADULT	6010090500	1	3	0.0006	0	1	0.0246
SIMULIIDAE SIMULIUM	LARVA	6010090500	4	65	0.0131	0	16	0.3632
SIMULIIDAE SIMULIUM	EXUVIA	6010090500	7	1	0.0002	0	1	0.0142
SIMULIUM DECORUM	LARVA	6010090502	4	7	0.0014	0	3	0.0620
SIMULIUM DECORUM	EXUVIA	6010090502	7	4	0.0008	0	2	0.0348
SIMULIUM TUBEROSUM	ADULT	6010090505	1	1	0.0002	0	1	0.0142
SIMULIUM TUBEROSUM	LARVA	6010090505	4	1	0.0002	0	1	0.0142
SIMULIUM VENUSTUM	ADULT	6010090506	1	9	0.0018	0	2	0.0471
SIMULIUM VENUSTUM	LARVA	6010090506	4	792	0.1602	0	71	2.1986
SIMULIUM VENUSTUM	PUPA	6010090506	5	14	0.0028	0	2	0.0635
SIMULIUM VENUSTUM	EXUVIA	6010090506	7	18	0.0036	0	2	0.0696
SIMULIUM VITTATUM	ADULT	6010090508	1	8	0.0016	0	3	0.0532
SIMULIUM VITTATUM	LARVA	6010090508	4	250	0.0506	0	32	0.8804
SIMULIUM VITTATUM	PUPA	6010090508	5	103	0.0208	0	60	0.9088
SIMULIUM VITTATUM	EXUVIA	6010090508	7	272	0.0550	0	200	2.9246
DIPTERA TABANIDAE	LARVA	6010110000	4	9	0.0018	0	1	0.0426
TABANIDAE CHRYSOPS	LARVA	6010110200	4	3	0.0006	0	1	0.0246
DIPTERA EMPIDIDAE	ADULT	6010120000	1	15	0.0030	0	3	0.0738
DIPTERA EMPIDIDAE	LARVA	6010120000	4	50	0.0101	0	11	0.1906
DIPTERA EMPIDIDAE	PUPA	6010120000	5	8	0.0016	0	5	0.0752
DIPTERA EMPIDIDAE	EXUVIA	6010120000	7	3	0.0006	0	1	0.0246
EMPIDIDAE NEOPLASTA	ADULT	6010120300	1	1	0.0002	0	1	0.0142
DIPTERA DOLICHOPODIDAE	ADULT	6010130000	1	3	0.0006	0	1	0.0246
DIPTERA SYRPHIDAE	LARVA	6010140000	4	1	0.0002	0	1	0.0142
DIPTERA EPHYDRIDAE	ADULT	6010170000	1	4	0.0008	0	1	0.0284
DIPTERA EPHYDRIDAE	EXUVIA	6010170000	7	2	0.0004	0	2	0.0284
DIPTERA ANTHOMYIIDAE	EXUVIA	6010190000	7	3	0.0006	0	2	0.0318
DIPTERA MUSCIDAE	ADULT	6010200000	1	4	0.0008	0	2	0.0348
DIPTERA CECIDOMYIIDAE	ADULT	6010210000	1	1	0.0002	0	1	0.0142
DIPTERA MYCETOPHILIDAE	ADULT	6010220000	1	70	0.0142	0	15	0.3100
DIPTERA MYCETOPHILIDAE	EXUVIA	6010220000	7	10	0.0020	0	10	0.1422
DIPTERA BIBIONIDAE	ADULT	6010230000	1	19	0.0038	0	8	0.1498
DIPTERA PHORIDAE	ADULT	6010240000	1	3	0.0006	0	1	0.0246
DIPTERA SCIARIDAE	ADULT	6010250000	1	1	0.0002	0	1	0.0142
DIPTERA DROSOPHILIDAE	ADULT	6010270000	1	1	0.0002	0	1	0.0142
INSECTA COLLEMBOLA		6021000000	.	6	0.0012	0	1	0.0348
INSECTA COLLEMBOLA	ADULT	6021000000	1	82	0.0166	0	23	0.4235
INSECTA COLLEMBOLA	EXUVIA	6021000000	7	1	0.0002	0	1	0.0142
COLLEMBOLA ENTOMOBRYIDAE		6021010000	.	3	0.0006	0	1	0.0246
COLLEMBOLA ISOTOMIDAE		6021030000	.	1	0.0002	0	1	0.0142
COLLEMBOLA SMINTHURIDAE		6021040000	.	1	0.0002	0	1	0.0142

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Table 1 (cont'd)

TAXA	LIFE STAGE	CODE TAXA	CODE LIFE STAGE	NUMBER	MEAN	MIN	MAX	STANDARD DEVIATION
INSECTA HOMOPTERA	ADULT	6031000000	1	2	0.0004	0	1	0.0201
INSECTA HOMOPTERA	NYMPH	6031000000	3	17	0.0034	0	14	0.2006
INSECTA HOMOPTERA	EXUVIA	6031000000	7	8	0.0016	0	2	0.0449
HOMOPTERA CERCOPIDAE	ADULT	6031010000	1	3	0.0006	0	1	0.0246
HOMOPTERA CERCOPIDAE	EXUVIA	6031010000	7	2	0.0004	0	2	0.0284
HOMOPTERA APHIDAE	ADULT	6031020000	1	2	0.0004	0	1	0.0201
HOMOPTERA APHIDAE	NYMPH	6031020000	3	2	0.0004	0	1	0.0201
HOMOPTERA APHIDAE	EXUVIA	6031020000	7	1	0.0002	0	1	0.0142
HOMOPTERA FULGORIDAE	NYMPH	6031030000	3	1	0.0002	0	1	0.0142
HOMOPTERA CICADELLIDAE	ADULT	6031040000	1	5	0.0010	0	1	0.0318
HOMOPTERA CICADELLIDAE	NYMPH	6031040000	3	2	0.0004	0	1	0.0201
HOMOPTERA CICADELLIDAE	EXUVIA	6031040000	7	2	0.0004	0	1	0.0201
HOMOPTERA PSYLLIDAE	ADULT	6031050000	1	1	0.0002	0	1	0.0142
HOMOPTERA PSYLLIDAE	NYMPH	6031050000	3	1	0.0002	0	1	0.0142
INSECTA PSOCOPTERA		6033000000	.	3	0.0006	0	2	0.0318
INSECTA THYSANOPTERA	ADULT	6038000000	1	1	0.0002	0	1	0.0142
THYSANOPTERA PHLOEOTHRIPIDAE	ADULT	6038010000	1	1	0.0002	0	1	0.0142
INSECTA HYMENOPTERA	ADULT	6043000000	1	10	0.0020	0	8	0.1155
INSECTA HYMENOPTERA	EXUVIA	6043000000	7	3	0.0006	0	1	0.0246
HYMENOPTERA FORMICIDAE	ADULT	6043010000	1	7	0.0014	0	1	0.0376
HYMENOPTERA TENTHREDOIDEA	LARVA	6043030000	4	2	0.0004	0	1	0.0201
HYMENOPTERA PARASITICA	ADULT	6043040000	1	37	0.0075	0	6	0.1563
HYMENOPTERA VESPOIDEA	ADULT	6043050000	1	2	0.0004	0	1	0.0201
INSECTA LEPIDOPTERA	ADULT	6045000000	1	1	0.0002	0	1	0.0142
INSECTA LEPIDOPTERA	LARVA	6045000000	4	6	0.0012	0	1	0.0348
INSECTA LEPIDOPTERA	PUPA	6045000000	5	2	0.0004	0	1	0.0201
LEPIDOPTERA PYRALIDAE	EXUVIA	6045000000	7	1	0.0002	0	1	0.0142
PYRALIDAE PARARGYRACTIS	LARVA	6045010000	4	3	0.0006	0	3	0.0427
LEPIDOPTERA TORTRICIDAE	LARVA	6045010300	4	1	0.0002	0	1	0.0142
LEPIDOPTERA TORTRICIDAE	ADULT	6045030000	1	5	0.0010	0	2	0.0376
LEPIDOPTERA GEOMETRIDAE	EXUVIA	6045030000	7	3	0.0006	0	3	0.0427
PISCES	ADULT	6045040000	1	1	0.0002	0	1	0.0142
PISCES		6300000000	.	2	0.0004	0	1	0.0201
PISCES	JUVENILE	6300000000	2	2	0.0004	0	1	0.0201
PISCES	LARVA	6300000000	4	10	0.0020	0	10	0.1422
GASTEROSTEUS ACULEATUS	EXUVIA	6300000000	7	1	0.0002	0	1	0.0142
GASTEROSTEUS ACULEATUS		6302010101	.	31	0.0063	0	3	0.0994
GASTEROSTEUS ACULEATUS	ADULT	6302010101	1	86	0.0174	0	16	0.3953
SALMONIFORMES SALMONIDAE	LARVA	6302010101	4	17	0.0034	0	4	0.0975
SALMONIFORMES SALMONIDAE	LARVA	6303010000	4	10	0.0020	0	4	0.0697
	EGG	6303010000	6	4	0.0008	0	2	0.0402
ALL	ALL	----------		157343	31.8250	0	6577	159.2663
ALL	ALL EXCEPT EXUVIA	----------		147706	29.8758	0	6557	158.0955

APPENDIX 2: WEIGHTS OF ANIMALS FROM BI-MONTHLY EKMAN GRAB SAMPLES FROM EACH LAKE, EACH YEAR, 1980-82. TAXONOMIC NAMES OF ONLY THOSE TAXA WEIGHED ARE LISTED, EXCEPT THAT IF TAXA WERE SORTED BEYOND THE FAMILY LEVEL FOR WEIGHING, THE FAMILY NAME IS ALSO PRESENTED. THE DEGREE OF INDENTATION OF THE TAXONOMIC NAMES IS INDICATIVE OF THE TAXONOMIC LEVEL.

Table 1. Weights of animals in bi-monthly Ekman grab samples from Headwater Pond, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		0.0003	18
Planariidae		0.0009	1
Nematoda		Trace	4
Bryozoa		0.0006	3
Hydrobiidae		0.0670	14
Physidae		0.0032	1
Planorbidae		0.1157	8
Unionidae		7.2751	5
Sphaeriidae		0.0216	9
Hirudinea		0.0014	3
Oligochaeta		0.0105	11
Araneae		0.0018	2
Hydracarina		0.0014	5
Harpacticoida		Trace	1
Cladocera		0.0003	2
Talitridae Hyallella azteca		0.0373	140
Gammaridae Crangonyx		0.0011	1
Baetidae	Nymph	0.0004	1
Leptophlebiidae	Nymph	0.0008	3

Table 1. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Ephemeridae			
Hexagenia	Nymph	0.0198	1
Coenagriidae	Nymph	0.0036	3
Libellulidae	Nymph	0.1543	15
Trichoptera	Larva	Trace	1
Polycentropodidae	Larva	0.0055	5
Hydropsychidae			
Cheumatopsyche	Larva	0.0019	1
Hydroptilidae			
Oxyethira	Larva	0.0005	1
Phryganeidae	Larva	0.0003	2
Leptoceridae			
Triaenodes	Larva	0.0006	2
Oecetis	Larva	0.0009	1
Diptera	Adult	0.0007	1
Culicidae	Adult	0.0001	1
Ceratopogonidae	Adult	0.0004	1
	Larva	0.0057	26
Chironomidae	Adult	0.0012	2
	Larva	0.1598	551
	Pupa	0.0022	6
Simuliidae	Adult	0.0006	1
Entomobryidae		0.0013	1

Table 2. Weights of animals in bi-monthly Ekman grab samples from Headwater Pond, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		0.0003	134
Planariidae		0.0007	1
Nematoda		Trace	6
Acanthocephala		Trace	1
Bryozoa		0.0008	5
Hydrobiidae		0.0741	25
Planorbidae		0.0092	6
Unionidae		12.4266	3
Sphaeriidae		0.7370	31
Rhynchobdellida Glossiphoniidae		0.0026	5
Oligochaeta		0.0083	13
Hydracarina		0.0011	13
Cladocera		0.0002	3
Amphipoda		Trace	1
Talitridae Hyallella azteca		0.0993	371
Gammaridae Crangonyx		0.0037	2
Baetidae	Nymph	0.0009	1
Leptophlebiidae	Nymph	0.0011	2

Table 2. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Caenidae	Nymph	0.0017	8
Hexagenia	Nymph	0.0559	2
Coenagriidae	Nymph	0.0133	3
Libellulidae	Nymph	0.1539	29
Elmidae	Larva	0.0005	1
Curculionidae	Adult	0.0226	2
Polycentropodidae	Larva	0.0027	5
Hydropsychidae			
Cheumatopsyche	Larva	0.0002	1
Hydroptilidae			
Oxyethira	Larva	0.0008	4
Phryganeidae	Larva	Trace	1
Leptoceridae			
Triaenodes	Larva	Trace	1
Oecetis	Larva	0.0018	1
Ceratopogonidae	Larva	0.0113	68
Chironomidae	Adult	0.0003	1
	Larva	0.0801	425
	Pupa	0.0022	6

Table 3. Weights of animals in bi-monthly Ekman grab samples from Headwater Pond, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	148
Nematoda		0.0035	2
Hydrobiidae		0.0345	21
Physidae		0.0045	1
Planorbidae		0.0241	17
Sphaeriidae		0.0345	20
Glossiphoniidae		0.0067	20
Oligochaeta		0.0009	4
Araneae		0.0057	2
Hydracarina		0.0004	3
Talitridae Hyallella azteca		0.0905	309
Leptophlebiidae	Nymph	0.0032	9
Caenidae Caenis	Nymph	0.0009	6
Ephemeridae Hexagenia	Nymph	0.1205	6
Coenagriidae	Nymph	0.0060	3
Libellulidae	Nymph	0.2275	12
Polycentropodidae	Larva	0.0019	1

Table 3. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Hydroptilidae			
Oxyethira	Larva	0.0004	2
Leptoceridae			
Oecetis	Larva	0.0017	3
Ceratopogonidae	Larva	0.0022	16
Chironomidae	Larva	0.0474	263
	Pupa	0.0010	3

Table 4. Weights of animals in bi-monthly Ekman grab samples from Spruce Pond, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	105
Planariidae		0.0014	2
Gordioidea		0.315	3
Bryozoa		Trace	1
Hydrobiidae		0.0465	13
Valvatidae		0.0656	27
Planorbidae		0.0835	2
Unionidae		11.0738	2
Sphaeriidae		0.0076	5
Hirudinea		0.0929	5
Oligochaeta		0.0078	7
Hydracarina		0.0006	7
Cyclopoida		Trace	1
Amphipoda	Juvenile	0.0004	1
Talitridae Hyallella azteca		0.0976	341
Gammaridae Crangonyx		0.0031	5
Leptophlebiidae Paraleptophlebia	Nymph	0.0008	2

Table 4. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Ephemerellidae			
Ephemerella	Nymph	0.0020	6
Caenidae			
Caenis	Nymph	0.0001	2
Ephemeridae			
Hexagenia	Nymph	0.0840	5
Coenagriidae	Nymph	0.0204	6
Aeshnidae	Nymph	0.0255	1
Libellulidae	Nymph	0.1161	4
Curculionidae	Larva	0.0205	1
Phryganeidae	Larva	0.0001	2
Leptoceridae			
Triaenodes	Larva	0.0009	2
Oecetis	Larva	0.0001	1
Ceratopogonidae	Larva	0.0036	21
Chironomidae	Adult	0.0004	1
	Larva	0.0113	69
Simuliidae	Larva	0.0001	1
Collembola		Trace	1

Table 5. Weights of animals in bi-monthly Ekman grab samples from Spruce Pond, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		0.0002	56
Planariidae		0.0015	1
Nematoda		Trace	2
Bryozoa	Exuvia	0.0001	3
Hydrobiidae		0.7485	15
Valvatidae		0.0997	25
Planorbidae		0.0524	3
Unionidae		8.0610	1
Sphaeriidae		0.0384	15
Hirudinea		0.0169	5
Hydracarina		0.0020	16
Podocopa		Trace	1
Amphipoda		Trace	5
Talitridae Hyallella azteca		0.0885	304
Gammaridae Crangonyx		0.0152	7
Lithobiomorpha		0.0163	1
Leptophlebiidae	Nymph	0.0002	2

Table 5. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Ephemerellidae			
Eurylophella	Nymph	0.006	3
Ephemeridae			
Hexagenia	Nymph	0.1598	14
Libellulidae	Nymph	0.0243	8
Chloroperlidae	Nymph	0.0006	1
Corixidae	Nymph	Trace	1
Helodidae	Larva	0.0002	1
Hydropsychidae			
Cheumatopsyche	Larva	0.0012	2
Phryganeidae	Larva	0.0034	1
Leptoceridae			
Triaenodes	Larva	0.0007	2
Oecetis	Larva	0.0003	1
Ceratopagonidae	Larva	0.0073	46
Chironomidae	Larva	0.0263	172
Simuliidae	Larva	0.0005	3

Table 6. Weights of animals in bi-monthly Ekman grab samples from Spruce Pond, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	160
Hydrobiidae		0.0437	29
Valvatidae		0.0200	9
Physidae		0.0225	6
Planorbidae		0.0841	15
Unionidae		9.6987	1
Sphaeriidae		0.0441	19
Hirudinea		0.0029	4
Glossiphoniidae		0.0015	3
Oligochaeta		0.0060	12
Araneae	Adult	Trace	1
Hydracarina		0.0009	7
Cladocera		Trace	1
Podocopa		0.0005	10
Amphipoda	Juvenile	0.0006	2
Talitridae Hyallella azteca		0.1747	601
Gammaridae Crangonyx		0.0363	12
Leptophlebiidae	Nymph	0.0023	8

Table 6. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Ephemerellidae	Nymph	0.0008	4
Caenidae			
Caenis	Nymph	0.0007	2
Ephemeridae			
Hexagenia	Nymph	0.0001	1
Coenagriidae	Nymph	0.0018	1
Libellulidae	Nymph	0.1298	7
Hydrophilidae	Adult	0.0014	1
Elmidae	Larva	0.0007	1
Polycentropodidae	Larva	Trace	2
Oxyethira	Larva	0.0003	3
Phryganeidae	Larva	0.0005	4
Leptoceridae	Larva	Trace	2
Triaenodes	Larva	0.0009	3
Oecetis	Larva	0.0011	8
Lepidostomatidae			
Lepidostoma	Larva	0.0018	1
Ceratopogonidae	Larva	0.0061	31
Chironomidae	Adult	0.0002	1
	Larva	0.0239	201
Simuliidae	Larva	Trace	1
Entomobryidae		Trace	1
Cicadellidae	Adult	0.0004	1

APPENDIX 3: WEIGHTS OF ANIMALS FROM CONTOUR EKMAN GRAB SAMPLES FROM EACH LAKE, EACH YEAR, 1980-82. TAXONOMIC NAMES OF ONLY THOSE TAXA WEIGHED ARE LISTED, EXCEPT THAT IF TAXA WERE SORTED BEYOND THE FAMILY LEVEL FOR WEIGHING, THE FAMILY NAME IS ALSO PRESENTED. THE DEGREE OF INDENTATION OF THE TAXONOMIC NAMES IS INDICATIVE OF THE TAXONOMIC LEVEL.

Table 1. Weights of animals in contour Ekman grab samples from Headwater Pond, July 20, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	283
Nematoda		0.0014	1
Nematomorpha		0.0188	7
Bryozoa		0.0012	2
Gastropoda		0.0038	1
Hydrobiidae		0.1330	50
Valvatidae		0.0344	7
Basommatophora		0.0255	1
Physidae		0.0061	1
Planorbidae		0.2741	10
Unionidae		40.4092	8
Sphaeriidae		0.1323	70
Hirudinea		0.0775	17
Oligochaeta		0.0123	26
Hydracarina		0.0052	51
Calanoida	Adult	Trace	1
Cyclopoida	Adult	Trace	1
Harpacticoida		Trace	2
Cladocera		0.0007	16
Podocopa		0.0005	10

Table 1. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Amphipoda	Juvenile	Trace	3
Talitridae Hyallella azteca		0.0523	162
Gammaridae Crangonyx		0.0019	13
Ephemeroptera	Nymph	0.0006	1
Caenidae Caenis	Nymph	0.0084	15
Ephemeridae Hexagenia	Nymph	0.0161	1
Coenagriidae	Nymph	0.0047	3
Aeshnidae	Nymph	0.0111	1
Libellulidae	Nymph	0.4273	38
Gyrinidae Gyrinus	Larva	0.0011	1
Chrysomelidae Donacia	Larva	0.0100	3
Polycentropodidae	Larva	0.0018	3
Limnephilidae	Pupa	0.0211	1
Leptoceridae	Larva Pupa	0.0004 0.0063	2 7
Oecetis	Larva	0.0018	2
Tipulidae Hexatoma brachycera	Adult	0.002	1

Table 1. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Ceratopogonidae	Larva	0.0038	31
	Pupa	0.0002	1
Chironomidae	Adult	0.0014	1
	Larva	0.0535	420
	Pupa	0.0006	5
Tabanidae	Larva	0.0032	1
Syrphidae	Larva	0.0114	1
Drosophilidae	Adult	0.0007	1
Collembola		0.0006	2
Cercopidae	Adult	0.0044	1
Formicidae	Adult	0.0002	2
Hymenoptera Parasitica	Adult	0.0012	3
Lepidoptera	Larva	0.0040	1
Pisces	Juvenile	0.0021	1

Table 2. Weights of animals in contour Ekman grab samples from Headwater Pond, July 21, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	318
Turbellaria		Trace	1
Planariidae		0.0014	3
Rotatoria		Trace	2
Nematoda		Trace	9
Gordioidea		0.0026	1
Tardigrada		Trace	1
Bryozoa		0.0007	5
Gastropoda		0.0008	3
Hydrobiidae		0.1100	41
Valvatidae		0.0059	1
Planorbidae		0.0230	7
Unionidae		8.9892	1
Sphaeriidae		0.0968	45
Hirudinea		0.0836	14
Oligochaeta		0.0293	62
Araneae		0.0009	2
Hydracarina		0.0006	37
Cyclopoida		Trace	2

Table 2. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Harpacticoida		Trace	24
Branchiopoda Cladocera		Trace	13
Podocopa		0.0001	8
Amphipoda	Juvenile	0.0001	18
Talitridae Hyallella azteca		0.1067	260
Gammaridae Crangonyx		0.0129	25
Caenidae Caenis	Nymph	0.0109	21
Coenagriidae	Nymph	0.0028	1
Anisoptera	Nymph	0.0312	4
Aeshnidae	Nymph	0.1446	2
Libellulidae	Nymph	0.2496	32
Chrysomelidae Donacia	Larva	0.0378	2
Staphylinidae	Adult	0.0005	1
Polycentropodidae	Larva	0.0039	5
Hydroptilidae Oxyethira	Pupa	0.0002	1
Phryganeidae	Larva	0.0002	1
Leptoceridae	Pupa	0.0004	1
Oecetis		0.0040	4

Table 2. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Helicopsychidae			
Helicopsyche	Larva	Trace	1
Diptera	Pupa	0.0005	1
Ceratopogonidae	Larva	0.0074	52
Chironomidae	Larva	0.0659	747
	Pupa	0.0005	5
Muscidae	Adult	0.0011	1
Sciaridae	Adult	0.0004	1
Cercopidae	Adult	0.0019	1
Psocoptera		Trace	2
Formicidae	Adult	0.0004	1

Table 3. Weights of animals in contour Ekman grab samples from Headwater Pond, July 20-21, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	1232
Planariidae		0.0005	1
Nematoda		0.0003	5
Bryozoa	Pupa	Trace	7
Hydrobiidae		0.2078	85
Valvatidae		0.0026	1
Planorbidae		0.1012	13
Unionidae		0.2394	9
Sphaeriidae		0.2271	103
Hirudinea		0.2893	6
Glossiphoniidae		0.0027	10
Oligochaeta		0.0127	30
Hydracarina		Trace	4
Hydrachnidae		0.0015	19
Oxidae Frontipoda		0.0001	2
Copepoda	Juvenile	Trace	1
Calanoida	Adult	Trace	1
Harpacticoida		Trace	23
Cladocera		0.0001	8
Podocopa		0.0002	11

Table 3. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Amphipoda	Juvenile	0.0003	14
Talitridae Hyallella azteca		0.1696	315
Gammaridae Crangonyx		0.0138	16
Baetidae	Nymph	0.0003	1
Leptophlebiidae	Nymph	Trace	2
Caenidae Caenis	Nymph	0.7016	33
Ephemeridae Hexagenia	Nymph	0.0097	1
Coenagriidae	Nymph	0.0065	6
Aeshnidae	Nymph	0.0752	1
Libellulidae	Nymph	0.7117	57
Staphylinidae	Adult	0.0001	1
Dermestidae Dermestes	Adult	0.0052	1
Polycentropodidae	Larva	0.0003	2
Phryganeidae	Pupa	0.0125	1
Agrypnia	Larva	0.0403	3
Leptoceridae	Pupa	0.0038	5
Oecetis	Larva	0.0047	5
Ceraclea	Larva	0.0022	2

Table 3. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Lepidostomatidae			
Lepidostoma	Larva	0.0017	1
Diptera	Pupa	0.0005	1
Tipulidae	Adult	0.0005	1
Ceratopogonidae	Larva	0.0080	45
	Pupa	0.0004	1
Chironomidae	Adult	Trace	2
	Larva	0.0885	727
	Pupa	0.0015	7
Simuliidae	Adult	0.7065	1
Ephyridae	Adult	0.0001	1
Entomobryidae		Trace	1
Isotomidae		0.0003	1
Sminthuridae		0.0001	1

Table 4. Weights of animals in contour Ekman grab samples from Spruce Pond, July 22-23, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	397
Planariidae		0.0042	7
Nematoda		0.0006	7
Gordioidea		0.0087	3
Bryozoa		0.0002	6
Gastropoda		0.0001	1
Hydrobiidae		0.2727	85
Valvatidae		0.2191	47
Physidae		0.0247	4
Planorbidae		0.3544	11
Pelecypoda	Juvenile	0.0006	1
Unionidae		2.5746	6
Sphaeriidae		0.2871	147
Hirudinea		1.4331	117
Oligochaeta		0.0410	73
Araneae		0.0002	1
Hydracarina		0.0093	93
Calanoida	Adult	Trace	1
Cyclopoida		Trace	9
Harpacticoida		Trace	1

Table 4. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Cladocera		0.0008	22
Podocopa		0.0002	8
Amphipoda	Juvenile	0.0011	30
Talitridae Hyallella azteca		0.1977	405
Gammaridae Crangonyx		0.0326	35
Insecta	Larva	Trace	1
Siphlonuridae Siphlonurus	Nymph	0.0218	4
Heptageniidae	Nymph	0.0002	1
Ephemerellidae Eurylophella	Nymph	0.0031	1
Caenidae	Nymph	0.0143	42
Ephemeridae Hexagenia	Nymph	0.5691	35
Coenagriidae	Nymph	0.0083	16
Aeshnidae	Nymph	0.0837	4
Libellulidae	Nymph	0.2944	41
Corixidae	Nymph	Trace	2
Gyrinidae	Adult	Trace	2
Elateridae	Adult	0.0025	1
Staphylinidae	Adult	0.0006	1

Table 4. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Phryganeidae	Larva	0.0004	2
Agrypnia	Larva	0.0165	1
Limnephilidae	Larva	0.0174	1
Leptoceridae	Pupa	0.0046	2
Oecetis	Larva	0.0053	13
	Pupa	Trace	1
Ceraclea	Larva	0.0070	4
Helicopsychidae			
Helicopsyche	Larva	0.0006	1
Diptera	Larva	Trace	1
Ceratopogonidae	Larva	0.0107	73
Chironomidae	Adult	0.0010	1
	Larva	0.0914	740
	Pupa	0.0019	9
Crytochironomus	Pupa	0.0030	2
Simuliidae	Adult	Trace	1
Empididae	Adult	0.0001	1
Collembola	Adult	0.0006	2
Homoptera	Nymph	0.0019	1
Parasitica	Adult	0.0007	1

Table 5. Weights of animals in contour Ekman grab samples from Spruce Pond, July 28, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	536
Hydrozoa		0.0004	2
Planariidae		0.0004	6
Nematoda		0.0006	5
Bryozoa		0.0002	5
Gastropoda		0.0013	2
Hydrobiidae		0.2616	117
Valvatidae		0.5173	113
Physidae		0.0083	4
Planorbidae		0.5107	47
Unionidae		2.3132	2
Sphaeriidae		0.2783	135
Hirudinea		0.1300	25
Oligochaeta		0.0246	41
Hydracarina		0.0050	56
Calanoida		Trace	3
Cyclopoida		0.0011	12
Harpacticoida		Trace	7
Cladocera		0.0004	45
Podocopa		0.0005	22

Table 5. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Amphipoda	Juvenile	0.0011	61
Talitridae Hyallella azteca		0.2046	1007
Gammaridae Crangonyx		0.0322	55
Lithobiomorpha		0.0001	1
Emphemeroptera	Nymph	0.0013	10
Siphlonuridae	Nymph	0.0003	1
Siphlonurus	Nymph	0.0087	1
Caenidae		0.0256	56
Ephemeridae Hexagenia	Nymph	0.0704	4
Coenagriidae	Nymph	0.0372	26
Aniscptera	Nymph	0.0150	2
Libellulidae	Nymph	0.4341	58
Plecoptera	Nymph	Trace	1
Coleoptera	Adult	0.0004	1
Haliplidae Haliplus	Larva	0.0001	1
Helodidae	Adult	0.0004	1
Chrysomelidae Donacia	Larva	0.0081	3
Staphylinidae	Adult	0.0093	1

Table 5. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Hydroptilidae			
Oxyethira	Larva	0.0012	4
Psychomyiidae	Adult	0.0009	1
Phryganeidae	Larva	0.0020	7
Limnephilidae	Larva	0.0136	1
Leptoceridae	Pupa	0.0004	1
Triaenodes	Larva	0.0010	1
Oecetis	Larva	0.0006	1
Diptera	Adult	Trace	1
	Larva	0.0001	2
	Pupa	Trace	1
Ceratopogonidae	Larva	0.0184	135
Chironomidae	Larva	0.0459	494
	Pupa	0.0004	6
Simuliidae	Adult	0.0004	1
Tabanidae	Larva	0.0184	2
Ephydridae	Adult	0.0002	2
Psocoptera		Trace	1

Table 6. Weights of animals in contour Ekman grab samples from Spruce Pond, July 27-28, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	1557
Hydridae		Trace	2
Planariidae		0.0019	3
Nematoda		0.0020	14
Bryozoa	Pupa	0.0001	4
Gastropoda	Juvenile	Trace	2
Hydrobiidae		0.1483	87
Valvatidae		0.1578	64
Physidae		0.0111	4
Planorbidae		0.2107	16
Unionidae		8.5080	5
Sphaeriidae		0.1717	117
Hirudinea		0.0210	3
Glossiphoniidae		0.0173	17
Oligochaeta		0.0305	41
Araneae		Trace	1
Hydracarina		Trace	6
Hydrachnidae		0.0052	39
Oxidae Frontipoda		0.0011	11

Table 6. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Phalangida		0.0007	1
Cyclopoida		Trace	1
Harpacticoida		Trace	1
Cladocera		Trace	1
Podocopa		0.0007	21
Malocostraca	Juvenile	0.0005	41
Talitridae Hyallella azteca		0.3606	817
Gammaridae Crangonyx		0.0399	57
Siphlonuridae	Nymph	0.0114	2
Ephemerellidae	Nymph	0.0008	13
Caenidae Caenis	Nymph	0.0103	29
Ephemeridae	Nymph	0.2337	18
Coenagriidae	Nymph	0.0091	12
Libellulidae	Nymph	0.7020	37
Corixidae	Nymph	0.0017	6
Lathridiidae	Adult	Trace	2
Cryptophagidae	Larva	0.0005	1
Trichoptera	Larva	Trace	2
Phryganeidae	Pupa	0.0087	1

Table 6. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Leptoceridae	Pupa	0.0087	7
Oecetis	Larva	0.0065	11
Ceratopogonidae	Larva	0.0152	109
	Pupa	Trace	1
Chironomidae	Larva	0.0832	701
	Pupa	0.0034	21
Tabanidae			
Chrysops	Larva	0.0051	2
Ephydridae	Adult	Trace	1
Mycetophilidae	Adult	0.0003	1
Cercopidae	Adult	0.0015	1
Pisces	Juvenile	0.0001	1

APPENDIX 4: WEIGHTS OF ANIMALS FROM ARTIFICIAL SUBSTRATES FROM EACH LAKE, EACH YEAR, 1981-82. TAXONOMIC NAMES OF ONLY THOSE TAXA WEIGHED ARE LISTED, EXCEPT THAT IF TAXA WERE SORTED BEYOND THE FAMILY LEVEL FOR WEIGHING, THE FAMILY NAME IS ALSO PRESENTED. THE DEGREE OF INDENTATION OF THE TAXONOMIC NAMES IS INDICATIVE OF THE TAXONOMIC LEVEL.

Table 1. Weights of animals in artificial substrate samples from Headwater Pond, September 22-23, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0096	21
Hydrobiidae		0.0666	27
Planorbidae		0.0885	5
Ancylidae		0.0014	2
Sphaeriidae		0.0008	1
Hirudinea		0.2637	12
Oligochaeta		0.0011	4
Talitridae Hyallella azteca		0.0279	132
Gammaridae		0.0029	2
Heptageniidae	Nymph	0.0720	62
Leptophlebiidae	Nymph	0.0633	268
Caenidae	Nymph	Trace	1
Coenagriidae	Nymph	0.0050	2
Aeshnidae	Nymph	1.4734	13
Libellulidae	Nymph	0.3890	12
Polycentropodidae	Larva	0.0095	15
Hydroptilidae	Larva	0.0002	1
Chironomidae	Larva	0.0276	151

Table 2. Weights of animals in artificial substrate samples from Headwater Pond, September 21-22, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Planariidae		0.0289	55
Hydrobiidae			
Amnicola		0.0772	28
Planorbida			
Helisoma		0.1525	2
Gyraulus		0.0244	23
Sphaeriidae		0.0068	6
Hirudinea		0.2710	36
Oligochaeta		0.0039	14
Talitridae			
Hyallella azteca		0.0274	109
Gammaridae		0.0095	4
Heptageniidae			
Stenonema femoratum	Nymph	0.1266	189
Leptophlebiidae	Nymph	0.0065	64
Leptophlebia cupida	Nymph	0.1154	481
Caenidae			
Caenis simulans	Nymph	0.0005	3
Coenagriidae			
Ischnura	Nymph	0.0222	8
Aeshnidae			
Aeshna	Nymph	4.3355	16
Corduliidae	Nymph	0.0916	12

Table 2. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Nemouridae Nemoura macdunnoughi	Larva	0.0001	1
Hemiptera	Nymph	0.0006	2
Polycentropodidae Nyctiophylax	Larva	0.0022	4
Polycentropus	Larva	0.0016	7
Hydroptilidae Oxyethira	Larva	0.0021	4
Ceratopogonidae	Larva	0.0009	3
Chironomidae	Larva	0.0385	279
Tabanidae	Larva	0.0233	1

Table 3. Weights of animals in artificial substrate samples from Spruce Pond, September 22-23, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0085	16
Hydrobiidae		0.0276	10
Physidae		0.0341	10
Planorbidae		0.1953	19
Ancylidae		0.0008	1
Sphaeriidae		0.0006	1
Hirudinea		1.5072	36
Oligochaeta		0.0031	4
Talitridae Hyallella		0.0050	25
Gammaridae		0.0052	2
Heptageniidae	Nymph	0.0501	49
Leptophlebiidae	Nymph	0.0541	144
Coenagriidae	Nymph	0.0197	5
Aeshnidae	Nymph	2.6489	17
Libellulidae	Nymph	0.2437	8
Polycentropodidae	Larva	0.0111	17
Hydropsychidae	Larva	0.0037	1
Phryganeidae	Larva	0.0092	2
Chironomidae	Larva	0.0120	110
Empididae	Larva	Trace	1
Gasterosteidae Gasterosteus aculeatus		0.0446	1

Table 4. Weights of animals in artificial substrate samples from Spruce Pond, September 21-23, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Planariidae		0.0090	18
Hydrobiidae Amnicola		0.0329	13
Planorbidae Helisoma		0.2691	9
Gyraulus		0.0025	2
Hirudinea		0.2470	28
Oligochaeta		0.0106	6
Araneae		0.0021	1
Hydracarina		0.0007	1
Talitridae Hyallella azteca		0.0172	77
Gammaridae		0.0088	4
Heptageniidae Stenonema femoratum	Nymph	0.0869	122
Stenonema vicarium	Nymph	0.0030	1
Leptophlebiidae	Nymph	0.0022	28
Leptophlebia cupida	Nymph	0.0378	130
Ephemerellidae Eurylophella funeralis	Nymph	0.0010	1
Aeshnidae Aeshna	Nymph	1.9162	13
Corduliidae Cordulia shurtleffi	Nymph	0.0874	8

Table 4. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Hemiptera	Nymph	0.0004	1
Polycentropodidae			
Nyctiophylax	Larva	0.0007	1
Polycentropus	Larva	0.0146	15
Hydropsychidae			
Hydropsyche recurvata	Larva	0.0039	1
Hydroptilidae			
Oxyethira	Larva	0.0006	2
Leptoceridae			
Ceraclea	Larva	0.0002	1
Ceratopogonidae	Larva	0.0011	2
Chironomidae	Larva	0.0544	404
Empididae	Larva	0.0003	1
Gasterosteidae			
Gasterosteus aculeatus		0.0239	1

APPENDIX 5: WEIGHTS OF ANIMALS FROM ARTIFICIAL SUBSTRATES FROM EACH STREAM, EACH YEAR, 1980-82. TAXONOMIC NAMES OF ONLY THOSE TAXA WEIGHED ARE LISTED, EXCEPT THAT IF TAXA WERE SORTED BEYOND THE FAMILY LEVEL FOR WEIGHING, THE FAMILY NAME IS ALSO PRESENTED. THE DEGREE OF INDENTATION OF THE TAXONOMIC NAMES IS INDICATIVE OF THE TAXONOMIC LEVEL.

Table 1. Weights of animals in artificial substrate samples from Headwater Pond's inlet, September 9, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Sphaeriidae		0.0054	2
Hirudinea		0.3897	25
Talitridae Hyallella azteca		0.0052	18
Heptageniidae	Nymph	0.4574	107
Leptophlebiidae	Nymph	0.1437	609
Ephemerellidae	Nymph	0.0025	31
Aeshnidae	Nymph	0.1233	7
Libellulidae	Nymph	0.1189	9
Chloroperlidae	Nymph	0.0053	82
Polycentropodidae	Larva	0.0134	22
Leptoceridae	Larva	Trace	1
Lepidostomatidae	Larva	Trace	1
Ceratopogonidae	Larva	0.0003	3
Chironomidae	Larva	0.0136	95
Empididae	Larva	Trace	1

Table 2. Weights of animals in artificial substrate samples from Headwater Pond's inlet, September 9, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Hydrobiidae		0.0013	1
Ancylidae		0.0004	1
Sphaeriidae		0.0014	2
Hirudinea		0.2587	40
Talitridae Hyallella azteca		0.0028	23
Heptageniidae	Nymph	0.6240	226
Leptophlebiidae	Nymph	0.1164	805
Ephemerellidae	Nymph	0.0009	7
Aeshnidae	Nymph	0.0225	5
Libellulidae	Nymph	0.0070	1
Chloroperlidae	Nymph	0.0025	58
Polycentropodidae	Larva	0.0100	32
Hydroptilidae	Larva	0.0008	6
Phryganeidae	Larva	0.0013	1
Limnephilidae	Larva	0.0077	1
Leptoceridae	Larva	0.0004	1
Chironomidae	Larva	0.0078	144

Table 3. Weights of animals in artificial substrate samples from Headwater Pond's inlet, September 8, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Hydrobiidae			
Amnicola		0.0072	2
Ancylidae			
Ferrissia		0.0039	3
Sphaeriidae		0.0013	1
Hirudinea		0.3050	53
Oligochaeta		0.0025	1
Talitridae			
Hyallella azteca		0.0051	15
Baetidae			
Baetis pygmaeus	Nymph	0.0004	1
Heptageniidae			
Stenonema femoratum	Nymph	0.0031	4
Stenonema vicarium	Nymph	0.4838	139
Leptophlebiidae	Nymph	0.0249	216
Habrophlebia vibrans	Nymph	0.0110	206
Leptophlebia cupida	Nymph	0.0730	352
Paraleptophlebia debilis	Nymph	0.0321	24
Ephemerellidae			
Eurylophella prudentalis	Nymph	0.0032	41
Aeshnidae			
Aeshna	Nymph	0.1156	4
Corduliidae	Nymph	0.0454	4
Leuctridae			
Leuctra ferruginea	Nymph	0.0008	9

Table 3. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Hemiptera	Adult	Trace	3
Nemouridae			
Nemoura macdunnoughi	Nymph	0.0017	58
Sisyridae	Larva	0.0008	1
Coleoptera	Adult	Trace	1
Elmidae			
Stenelmis crenata	Adult	0.0006	1
Polycentropodidae			
Nyctiophylax	Larva	0.0784	127
Polycentropus	Larva	0.0055	43
Hydropsychidae			
Hydropsyche sparna	Larva	0.0017	1
Hydroptilidae			
Oxyethira	Larva	0.0049	41
Phryganeidae			
Oligostomis	Larva	0.0052	1
Molannidae			
Molanna	Larva	0.0013	1
Leptoceridae			
Mystacides	Larva	0.0002	3
Ceraclea	Larva	0.0021	2
Ceratopogonidae	Larva	0.0009	2
Chironomidae	Larva	0.0179	132
	Pupa	Trace	2

Table 4. Weights of animals in artificial substrate samples from Headwater Pond's outlet, September 10, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0289	46
Hydrobiidae		0.0183	5
Physidae		0.0012	2
Planorbidae		0.0029	4
Ancyiidae		0.0018	1
Sphaeriidae		0.0252	39
Hirudinea		2.8476	172
Oligochaeta		0.0004	7
Talitridae Hyallella azteca		0.0586	200
Gammaridae		0.0095	6
Heptageniidae	Nymph	0.1607	177
Leptophlebiidae	Nymph	0.0160	81
Ephemerellidae	Nymph	0.0012	15
Coenagriidae	Nymph	0.0046	1
Aeshnidae	Nymph	1.1324	13
Libellulidae	Nymph	0.1625	11
Chloroperlidae	Nymph	0.0052	4
Elmidae	Adult	0.0078	18
Philopotamidae	Larva	0.0075	21
Polycentropodidae	Larva	0.4351	597

Table 4. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Hydropsychidae	Larva	0.9748	1229
Hydroptilidae	Larva	0.0013	2
Phryganeidae	Larva	0.1024	11
Leptoceridae	Larva	0.0006	1
Lepidostomatidae	Larva	Trace	1
Ceratopogonidae	Larva	Trace	1
Chironomidae	Larva	0.0685	717
Simuliidae	Larva	0.0004	2
Empididae	Larva	0.0020	10

Table 5. Weights of animals in artificial substrate samples from Headwater Pond's outlet, September 10, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0369	29
Sphaeriidae		0.0308	21
Hirudinea		1.8744	136
Oligochaeta		0.0012	15
Hydracarina		0.0012	2
Talitridae Hyallella azteca		0.0229	110
Gammaridae		0.0058	1
Heptageniidae	Nymph	0.2861	246
Leptophlebiidae	Nymph	0.0310	122
Ephemerellidae	Nymph	0.0003	1
Coenagriidae	Nymph	0.0049	1
Aeshnidae	Nymph	0.4684	7
Libellulidae	Nymph	0.1424	6
Chloroperlidae	Nymph	0.0008	3
Elmidae	Adult	0.0022	6
Philopotamidae	Larva	0.0007	1
Polycentropodidae	Larva	0.2431	294
Hydropsychidae	Larva	0.5620	700
Hydroptilidae	Larva	Trace	1
Phryganeidae	Larva	0.0094	11

Table 5. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Lepidostomatidae	Larva	0.0018	1
Ceratopogonidae	Larva	0.0005	1
Chironomidae	Larva	0.0195	330
Empididae	Larva	0.0019	6
Collembola		0.0013	1

Table 6. Weights of animals in artificial substrate samples from Headwater Pond's outlet, September 8, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Planariidae		0.0235	34
Hydrobiidae Amnicola		0.0010	1
Planorbidae Gyraulus		0.0015	1
Ancylidae Ferrissia		0.0064	17
Sphaeriidae		0.0047	4
Hirudinea		2.1012	139
Oligochaeta		0.0008	4
Araneae		Trace	1
Hydracarina		0.0005	2
Talitridae Hyallella azteca		0.0275	139
Gammaridae Crangonyx		0.0043	3
Heptageniidae Stenonema femoratum	Nymph	0.2722	474
Stenonema vicarium	Nymph	0.0377	10
Leptophlebiidae	Nymph	0.0135	176
Leptophlebia cupida	Nymph	0.0067	48
Paraleptophlebia debilis	Nymph	0.0199	12

Table 6. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Ephemerellidae			
Ephemerella subvaria	Nymph	0.0008	7
Eurylophella funeralis	Nymph	0.0023	13
Eurylophella prudentalis	Nymph	0.0005	2
Coenagriidae			
Ischnura	Nymph	0.0474	9
Aeshnidae			
Aeshna	Nymph	0.5013	9
Corduliidae			
Cordulia shurtleffi	Nymph	0.0163	2
Somatochlora	Nymph	0.2179	8
Leuctridae			
Leuctra ferruginea	Nymph	0.0003	1
Perlodidae			
Isoperla transmarina	Nymph	0.0004	7
Elmidae			
Promoresia tardella	Adult	0.0002	1
Stenelmis crenata	Larva	0.0086	17
Stenelmis crenata	Adult	Trace	2
Philopotamidae			
Chimarra	Larva	0.0015	6
Polycentropodidae			
Neureclipsis	Larva	0.0123	37
Nyctiophylax	Nymph	0.0051	3

Table 6. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Polycentropus	Larva	0.0203	88
Hydropsychidae Hydropsyche betteni	Larva	0.0144	4
Hydropsyche recurvata	Larva	0.0641	10
Cheumatopsyche pettiti	Larva	0.2469	451
Hydroptilidae Oxyethira	Larva	Case wts included 0.0008	2
Limnephilidae	Larva	0.0007	1
Leptoceridae Mystacides	Larva	0.0001	1
Lepidostomatidae Lepidostoma	Larva	0.0003	2
Ceratopogonidae	Larva	0.0008	1
Chironomidae	Larva	0.0244	392
Simuliidae Simulium vittatum		0.0009	6

Table 7. Weights of animals in artificial substrate samples from Spruce Pond's major inlet, September 9, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0031	6
Planorbidae		Trace	1
Hirudinea		0.2033	43
Oligochaeta		0.0021	5
Hydracarina		0.0001	1
Talitridae Hyallella azteca		0.0268	113
Gammaridae		0.0120	5
Heptageniidae	Nymph	0.2861	157
Leptophlebiidae	Nymph	0.0583	482
Ephemerellidae	Nymph	Trace	3
Aeshnidae	Nymph	0.0071	2
Libellulidae	Nymph	0.0400	1
Chloroperlidae	Nymph	0.0005	14
Elmidae	Adult	0.0009	1
Polycentropodidae	Larva	0.0091	20
Hydroptilidae	Larva	0.0008	6
Phryganeidae	Larva	0.0009	1
Leptoceridae	Larva	0.0090	2
Chironomidae	Larva	0.0028	90

Table 8. Weights of animals in artificial substrate samples from Spruce Pond's major inlet, September 10, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0006	2
Hydrobiidae		0.0105	4
Lymnaeidae		0.0010	1
Hirudinea		0.2339	56
Oligochaeta		0.0010	4
Talitridae Hyallella azteca		0.0122	89
Gammaridae		0.0259	12
Heptageniidae	Nymph	0.2119	150
Leptophlebiidae	Nymph	0.1146	703
Ephemerellidae	Nymph	0.0006	13
Aeshnidae	Nymph	0.2081	7
Chloroperlidae	Nymph	0.0004	6
Elmidae	Adult	0.0009	1
Polycentropodidae	Larva	0.0194	68
Hydropsychidae	Larva	0.0017	3
Hydroptilidae	Larva	Trace	3
Leptoceridae	Larva	0.0003	1
Lepidostomatidae	Larva	Trace	2
Chironomidae	Larva	0.0080	132

Table 9. Weights of animals in artificial substrate samples from Spruce Pond's major inlet, September 9, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Planariidae		0.0013	3
Hydrobiidae			
Amnicola		0.0172	6
Lymnaeidae			
Stagnicola		0.0358	1
Ancylidae			
Ferrissia		0.0009	1
Hirudinea		0.2099	70
Talitridae			
Hyallella azteca		0.0303	117
Gammaridae			
Crangonyx		0.0434	21
Heptageniidae			
Stenonema	Nymph	0.1957	56
Leptophlebiidae	Nymph	0.0071	120
Habrophlebia vibrans	Nymph	0.0001	38
Leptophlebia cupida	Nymph	0.1092	386
Ephemerellidae			
Eurylophella	Nymph	0.0010	16
Aeshnidae			
Aeshna	Nymph	0.5857	6
Leuctridae			
Leuctra ferruginea	Nymph	0.0007	1

Table 9. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Nemouridae			
Nemoura macdunnoughi	Nymph	0.0001	4
Polycentropodidae			
Neureclipsis	Larva	0.0014	2
Nyctiophylax	Larva	0.0175	25
Polycentropus	Larva	0.0317	138
Hydroptilidae			
Oxyethira	Larva	0.0064	58
Phryganeidae			
Ptilostomis	Larva	0.0005	1
Oligostomis	Larva	0.0032	1
Agrypnia	Larva	0.0020	1
Chironomidae	Larva	0.0085	130
	Pupa	Trace	2

Table 10. Weights of animals in artificial substrate samples from Spruce Pond's minor inlet, September 11, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0009	2
Physidae		0.0009	1
Ancylidae		0.0007	2
Sphaeriidae		0.1064	24
Hirudinea		0.3588	31
Oligochaeta		0.0123	19
Talitridae Hyallella azteca		0.0054	33
Leptophlebiidae	Nymph	0.0002	2
Ephemerellidae	Nymph	0.0007	1
Coenagriidae	Nymph	0.0014	1
Aeshnidae	Nymph	0.1104	5
Libellulidae	Nymph	0.0594	9
Elmidae	Adult	0.0003	1
Polycentropodidae	Larva	0.0041	3
Hydropsychidae	Larva	0.0002	1
Phryganeidae	Larva	0.0137	10
Ceratopogonidae	Larva	0.0039	15
Chironomidae	Larva	0.0068	54
Tabanidae	Larva	0.0085	1

Table 11. Weights of animals in artificial substrate samples from Spruce Pond's minor inlet, September 8, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Hydrobiidae		0.0010	10
Physidae		0.0021	3
Planorbidae		0.0022	1
Ancylidae		0.0032	25
Sphaeriidae		0.4045	184
Hirudinea		0.6534	82
Oligochaeta		0.0083	19
Talitridae Hyallella azteca		0.1161	528
Gammaridae		0.0219	6
Heptageniidae	Nymph	0.0281	26
Leptophlebiidae	Nymph	0.3965	1682
Ephemerellidae	Nymph	0.0108	65
Caenidae	Nymph	0.0006	1
Aeshnidae	Nymph	0.6725	24
Libellulidae	Nymph	0.3605	15
Dytiscidae	Adult	0.0024	5
Elmidae	Adult	Trace	2
Polycentropodidae	Larva	0.0059	17
Hydroptilidae	Larva	0.0017	20

Table 11. (Cond'd)

Taxa	Life stage	Weight (g)	Number of individuals
Phryganeidae	Larva	0.0010	1
Limnephilidae	Larva	0.0056	1
Leptoceridae	Larva	0.0011	2
Ceratopogonidae	Larva	0.0066	17
Chironomidae	Larva	0.0169	219
Empididae	Larva	0.0060	2
Collembola		Trace	1
Pyralidae Parargyractis	Larva	0.0098	1

Table 12. Weights of animals in artificial substrate samples from Spruce Pond's minor inlet, September 7, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Protozoa		Trace	1
Planariidae		0.0006	3
Hydrobiidae Amnicola		0.0035	1
Ancylidae Ferrissia		0.0096	38
Sphaeriidae		0.1644	61
Hirudinea		1.1617	46
Oligochaeta		0.0002	4
Hydracarina		0.0003	1
Talitridae Hyallella azteca		0.0820	449
Gammaridae Crangonyx		0.0132	9
Heptageniidae Stenonema femoratum	Nymph	0.0061	7
Stenonema vicarium	Nymph	0.0071	2
Leptophlebiidae	Nymph	0.0271	555
Leptophlebia cupida	Nymph	0.0717	347
Paraleptophlebia debilis	Nymph	0.0066	6
Ephemerellidae Eurylophella	Nymph	0.0095	114

Table 12. (Cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Coenagriidae			
Nehalennia	Nymph	0.0011	1
Ischnura	Nymph	0.0002	2
Aeshnidae			
Aeshna	Nymph	1.5003	34
Corduliidae			
Cordulia shurtleffi	Nymph	0.1084	7
Somatochlora	Nymph	0.0697	9
Hemiptera	Adult	0.0015	2
Sisyridae	Larva	0.0001	1
Elmidae			
Stenelmis crenata	Larva	0.0102	1
Polycentropodidae			
Nyctiophylax	Larva	0.0042	4
Polycentropus	Larva	0.0137	39
Hydropsychidae			
Cheumatopsyche pettiti	Larva	0.0002	8
Hydroptilidae			
Oxyethira	Larva	0.0093	56
Ceratopogonidae	Larva	0.0018	11
Chironomidae	Larva	0.0173	276
	Pupa	Trace	3
Simuliidae			
Eusimulium congareenarum	Larva	0.0008	1
Simulium vittatum	Larva	0.0001	1

Table 13. Weights of animals in artificial substrate samples from Spruce Pond's outlet, September 9, 1980.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0277	21
Lymnaeidae		0.1095	4
Sphaeriidae		1.8134	804
Hirudinea		0.4712	92
Oligochaeta		0.0016	25
Hydracarina		0.0007	1
Talitridae Hyallella azteca		0.0111	36
Gammaridae		0.0211	8
Heptageniidae	Nymph	0.1591	99
Leptophlebiidae	Nymph	0.0623	521
Ephemerellidae	Nymph	Trace	1
Aeshnidae	Nymph	0.7671	6
Libellulidae	Nymph	0.0220	2
Chloroperlidae	Nymph	0.0028	11
Elmidae	Adult	0.0013	3
Philopotamidae	Larva	0.1014	215
Polycentropodidae	Larva	0.9159	1044
Hydropsychidae	Larva	2.4120	1064
Phryganeidae	Larva	0.0278	4

Table 13. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Leptoceridae	Larva	0.0007	2
Lepidostomatidae	Larva	Trace	3
Ceratopogonidae	Larva	0.0004	1
Chironomidae	Larva	0.1200	375

Table 14. Weights of animals in artificial substrate samples from Spruce Pond's outlet, September 9, 1981.

Taxa	Life stage	Weight (g)	Number of individuals
Turbellaria		0.0165	36
Lymnaeidae		0.1118	4
Sphaeriidae		1.6019	766
Hirudinea		2.1299	395
Oligochaeta		0.0002	24
Hydracarina		0.0036	4
Talitridae Hyallella azteca		0.1553	629
Gammaridae		0.0402	12
Heptageniidae	Nymph	0.1131	95
Leptophlebiidae	Nymph	0.1484	1915
Aeshnidae	Nymph	0.6903	13
Chloroperlidae	Nymph	0.0027	15
Sisyridae	Larva	0.0015	1
Elmidae	Adult	0.0034	6
Philopotamidae Chimarra	Larva	0.0152	25
Polycentropodidae	Larva	1.0243	1107
Hydropsychidae	Larva	2.0251	33
Hydroptilidae	Larva	0.0009	1
Phryganeidae	Larva	0.0378	4

Table 14. (cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Lepidostomatidae	Larva	0.0014	3
Ceratopogonidae	Larva	0.0013	2
Chironomidae	Larva	0.0279	464

Table 15. Weights of animals in artificial substrate samples from Spruce Pond's outlet, September 9, 1982.

Taxa	Life stage	Weight (g)	Number of individuals
Planariidae		0.0266	70
Hydrobiidae		0.0001	1
Sphaeriidae		0.2925	142
Hirudinea		2.2547	161
Hydracarina		0.0008	3
Talitridae Hyallella azteca		0.0287	131
Gammaridae Crangonyx		0.0265	16
Baetidae Baetis pygmaeus	Nymph	0.0002	2
Heptageniidae Heptagenia	Nymph	0.0011	561
Stenonema femoratum	Nymph	0.4312	561
Stenonema vicarium	Nymph	0.0445	71
Leptophlebiidae	Nymph	0.0146	268
Habrophlebia vibrans	Nymph	0.0002	2
Leptophlebia cupida	Nymph	0.0486	252
Paraleptophlebia debilis	Nymph	0.0114	11
Caenidae Caenis simulans	Nymph	0.0001	2
Aeshnidae Aeshna	Nymph	0.3636	6

Table 15. (Cont'd)

Taxa	Life stage	Weight (g)	Number of individuals
Corduliidae			
Somatochlora	Nymph	0.0043	2
Nemoura macdunnoughi	Nymph	0.0001	10
Perlodidae			
Isoperla	Nymph	0.0013	11
Philopotamidae			
Chimarra	Larva	0.0151	57
Polycentropodidae			
Neureclipsis	Larva	0.2708	602
Nyctiophylax	Larva	0.0252	27
Polycentropus	Larva	0.1122	366
Hydropsychidae			
Hydropsyche recurvata	Larva	0.2440	100
Cheumatopsyche pettiti	Larva	0.0416	91
Hydroptilidae			
Oxyethira	Larva	0.0005	6
Phryganeidae			
Ptilostomis	Larva	0.0005	1
Leptoceridae			
Ceraclea	Larva	0.0018	15
Lepidostomatidae			
Lepidostoma	Larva	0.0034	23
Chironomidae	Larva	0.0065	164
	Pupa	Trace	2
Simuliidae			
Simulium vittatum	Larva	0.0001	1
Empididae	Larva	0.0001	1